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SUMMARY OF READING INVESTIGATIONS

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WILLIAM S. GRAY
University of Chicago

Editor's note: No one aspect of the school's program has had more attention in recent years than the subject of reading. An authority in reading supplies in the paper here presented a summary of researches in this field.

THIS article presents a brief summary of investigations relating to reading published between July 1, 1938, and June 30, 1939. It continues the series that has appeared in the *Journal of Educational Research* since February, 1933. The discussion that follows aims chiefly to acquaint the reader with the major types of studies published during the year and with the most significant findings. A study of the contents of this article should be followed by a critical reading of the various reports which are of special interest to the reader.

Major Problems Studied. The fact should be pointed out that interest in the scientific study of reading problems has increased notably of late. The number of studies reported during 1938-39 is greater than during any previous year. It is equally gratifying that the quality of the studies reported continues to improve steadily.

An analysis of the studies summarized in this report shows that effort is still directed largely to the solution of problems at the elementary-school level, although the higher levels are by no means neglected. The issues most widely considered relate to reading readiness, the evaluation of reading readiness tests, the relation of ability to recognize the details of words to progress in learning to read, the value and limitations of phonics, methods and conditions that influence progress in primary reading, the vocabularies of readers and other reading material, the concepts included in readers and the understandings pupils derive from reading, methods of developing meaning vocabularies, and factors that influence oral reading, comprehension, and speed of reading.

Overlapping the elementary, secondary, and college levels are various

studies such as those relating to reading in different curriculum fields, reading interests and methods of stimulating them, group remedial reading, the causes of extreme forms of reading disability, reading and visual tests, and the hygiene of reading. A limited number of studies that were concerned specifically with eye movements in reading, the relation between speed and comprehension, the causes of slow reading, and the value of different instruments in improving span of recognition and speed of reading were also reported.

Reading Readiness. Most of the studies reported in this field relate to factors that influence progress in beginning reading. In this connection various types of tests were given and the results correlated with the pupils' subsequent progress in reading. For example, Gates, Bond and Russell (41) correlated progress in reading at the end of three semesters with each of 39 test scores secured at the beginning of the first grade. Dean (23), Huggett (59) and Petty (86) each used five measures of reading readiness and correlated the results with one or more records of progress in reading. The findings indicated that mental age is a highly significant factor in reading readiness, although it is by no means the only one. In harmony with the results of previous studies Dean pointed out that the optimum mental age for average work in first-grade reading is six years and a half or more. "Below this age far more pupils failed than succeeded." (23: 616). These facts are often interpreted to mean that reading should be postponed in the case of many first-grade pupils. An equally promising assumption is that the approach to reading in the first-grade could be further simplified to advantage.

In order to test the validity of delaying reading in the case of pupils with low I.Q.'s, Gates and Russell (44) compared the progress in reading of two paired groups. One group began reading two months after entering school and the other group one semester and two months after beginning school. When the two groups were given the Gates Silent Reading Test, the experimental section revealed "a superiority at mid-year which becomes more pronounced at the end of the year" (44: 326). The preparatory instruction, "together with the advantage of a half year of additional age and nearly a half-year higher mental age, enables dull-normal, underprivileged, socially, physically, and emotionally inferior children to read better than similar pupils" who do not have these advantages. The study does not show whether or not a longer or shorter period of preparation would have been better. In the judgment of the investigators the most significant conclusion justified by the study was

that "the main sources of difficulty in learning are individual problems which must be solved as such and which are, in most cases, not removed by *mere* delay in beginning reading" (44: 328).

When the influence of chronological age was considered it was found to be far less significant than mental age. For example, Petty concluded that chronological age is not important "when the members of a group do not vary greatly in age, and when all the members of the group are at least six years old" (86: 227).

There was general agreement that girls do better than boys on most of the readiness tests as well as on achievement tests in reading. It was suggested that the high standing of girls in these tests could be attributed largely to their greater facility in the use of language. Wilson, Burke, and Flemming (120) secured evidence, however, which lends support to the assumption that superiority in reading ability may be accompanied by "superiority in the important letter abilities functioning in the mechanics of reading, rather than with mental superiority or with sex in and of themselves" (120: 579).

Dean found that the relation between good and poor vision and success in beginning reading is very low "and even negative in some cases" (23: 616). Petty reported that ability to distinguish between visual symbols is important to success in beginning reading, that eidetic ability may exert a positive influence, and that susceptibility to illusions may or may not be favorable to success in reading. Gates, Bond and Russell found that of the tests which they used the following were the best for predicting reading progress: word recognition, ability to complete a partially told story, giving words which end with and which begin with the same sound as an example, blending word sounds, ability to read letters of the alphabet, ability "to listen to, understand, and make use of the teacher's instructions in beginning reading" (41: 52).

The fact was emphasized by two investigators that the general findings referred to above vary widely in value for predicting success in individual cases and in different schools. For example, Petty pointed out that other factors, such as home, social, health, disciplinary, or personality problems, might outweigh the influence of certain other factors which correlated in general with success in beginning reading. Gates, Bond and Russell emphasized the fact that to "the extent that the teacher's methods influence the pupil's techniques of learning, they also affect the predictive value of tests. Thus if a teacher effectively emphasizes early phonetic attack, tests of blending, rhyming, etc., are likely

to give higher correlations with reading progress in her class than in the class of a teacher who places less emphasis on the phonetic approach" (41: 52-53).

Evaluation of Reading Readiness Tests. Several of the studies referred to above made use of one or more reading readiness tests and tried to determine their prognostic value. In addition, Gates (40) and Fendrick and McGlade (37) reported specific studies of the relative value of such tests for prognostic purposes. Their findings indicate that all the mental tests and reading readiness tests studied have reasonably high prognostic value. In general the correlation between mental tests and progress in learning to read was greater than between reading readiness tests and progress in reading. For example, Petty (86) reported a correlation of .52 between mental age and reading marks, .48 between intelligence quotients and reading marks, and .44 between the total score on the Lee-Clark Reading Readiness Test and reading grades. Dean (23) found a correlation of .62 between mental age and first-grade reading achievement and of .59 and .41 respectively between the scores on each of two reading readiness tests and reading achievement.

Both Dean and Fendrick and McGlade found that the use of a reading readiness test in addition to a mental test was only slightly more accurate in predicting progress in beginning reading than the use of a mental test alone. This fact is readily explained by the high correlation between mental tests and reading readiness tests which indicate that they measure essentially the same functions. For example, Fendrick and McGlade found a correlation of .94 between the Detroit First-Grade Intelligence Test and the Metropolitan Readiness Test. However, these investigators believe that a "critical utilization" of both tests "enhances their significance for prediction of first-grade achievement" (37: 194).

Studies of the value of different reading readiness tests revealed facts that are interesting but not conclusive. Dean (23) found a correlation of .59 between scores on the Metropolitan Readiness Tests and reading achievement as measured by the Metropolitan Reading Achievement Test, Grade I, Form A, and .41 between the Monroe Reading Aptitude Tests and reading achievement. When using the Detroit Word Recognition Test as a measure of reading achievement Huggett (59) found a correlation of .63 with scores on the Metropolitan Reading Readiness Test and a correlation of .71 with scores on the Van Wagenen Readiness Tests. Because of the limited number of readiness tests included in each study and the widely different measures of reading achievement that

were used final conclusions concerning the relative merits of readiness tests cannot be drawn from the data presented.

As a result of a study including the use of various predictive tests Gates concluded that "the teacher will profit most from reading-readiness tests if she concerns herself with a pupil's status in each test and arranges her later work to conform to it." (40: 507). This statement does not deny the value of the total score. When only the total score is used, however, "much, if not most, of the information of value for the *guidance* of the pupil is lost and the predictive value is often lowered" (40: 507).

Relation of Ability to Recognize the Details of Words to Progress in Learning to Read. In an effort to determine factors and conditions that influence progress in beginning reading several investigators secured evidence which emphasizes the value of ability to recognize details of words. Wilson, Burke, and Flemming (120), for example, found that "superiority in reading ability tended to be accompanied by superiority in the important letter abilities functioning in the mechanics of reading. . . ." (120: 579). Further analysis of their data pointed to the conclusion that "the greater tendency of boys to make errors in learning letter and word forms, may explain to a considerable extent the apparent superiority of the girls in progressing in learning to read in grades one and two." (120: 581). The fact was emphasized that teachers should adapt their guidance to different needs of children in respect to letter and word recognition.

Further evidence of the importance of the mastery of the forms and sounds of letters was secured by Wilson and Flemming (121), (122), (123). As a result of the analysis of test records secured from kindergarten and first-grade pupils they concluded that "particularly close relationships obtained between skill in reading and certain other abilities with letter forms and sounds. . . . The practical applications of the findings of this study seems to be careful guidance of children by teachers in making use of letter forms and sounds in mastering the mechanics of reading" (122: 49-51). Their data indicated also that "need for this guidance begins long before Grade I, and for some children probably continues for a considerable time after Grade I" (121: 31). The investigators point out vigorously, however, that such findings do not justify the traditional practice of drilling pupils at length "on the alphabet, syllables, and phonograms, with little, if any, relation of such drill to felt needs and interests." They rightly maintained that any emphasis

on the forms and sounds of basic elements in reading should be functional in the sense of "promoting the comprehension of ideas which satisfy reader's needs" (122: 51-52).

Value and Limitation of Phonics in Learning to Read. Closely related to the preceding group of studies are those concerned with the value of phonics in learning to read. In this connection, Turrentine (115) reviewed recent trends, Spache (99) and Gunderson (49) attempted to identify the elements which should be taught and Gates and Russell (43) and Agnew (1) reported the results of experiments to determine the value of teaching phonics.

The review of recent trends by Turrentine showed clearly that many conflicting theories and practices prevail in teaching phonics. In this connection the inadequacy of early phonic training in attacking polysyllabic words was pointed out. She concluded that perhaps current difficulties and confusion lie not so much in the basic concept of or need for phonics as in the way it is taught. Somewhat similar conclusions were reached by Spache. After reviewing the results of various studies he expressed the view that "final arguments against phonics, on the grounds that it engenders undesirable habits of word-analysis and produces slow, uninterested readers, may be answered . . . by more careful choice of materials of instruction and stricter attention to relevant psychological facts and principles" (99: 149). Whereas no objective evidence was presented to support these views it is significant that both investigators reached similar conclusions.

In determining what phonics should be taught Spache (99) analyzed critically the results of several studies of the nature and frequency of the phonetic elements in words and developed a series of criteria for selection. Gunderson (49) directed attention specifically to the phonograms listed in ten reading manuals for use in Grades I and II. The findings and recommendations of these investigators cannot be reported here in detail. The fact should be pointed out, however, that each concluded that the teaching of phonics could be simplified to advantage and that specific types of guidance should be introduced, as a rule, in response to pupil needs.

Gates and Russell (43) compared the reading achievement of first-grade pupils classified according to scores on the Metropolitan Readiness Tests and according to the amount and kind of phonetic instruction received. Group D included those who received the smallest amount of phonics or word analysis; group E received a moderate amount of "in-

formal, newer-type word analysis''; group F received substantial or large amounts of conventional phonetic drill. The results of the tests showed that Group E made the most effective progress and justified the conclusion that a moderate amount of training in word analysis is better than no such training or of large amounts of conventional phonetic drill.

Without doubt the most elaborate study of the value and limitations of phonics, reported during recent years, was carried on by Agnew (1) in Raleigh and Durham, North Carolina. Through the use of carefully planned procedures he identified the amount and character of the phonetic training given in grades I, II, and III and compared the achievement of pupils in the last half of grade III in both oral and silent reading. The evidence secured led to the conclusion that consistent training in phonics "(a) increases independence in recognizing words previously learned; (b) aids in 'unlocking' new words by giving the pupil a method of sound analysis; (c) encourages correct pronunciation; and (d) improves the quality of oral reading" (1:44). The investigator maintained that a number of objections to phonetic training have been exaggerated. He found no evidence for example, that large consistent amounts of phonetic training tend "(a) to sacrifice interest in the content of reading; (b) to result in the neglect of context clues; (c) to result in unnecessarily laborious recognition of unfamiliar words; and (d) to be unnecessary because the advantages attributed to phonetic training might be obtained without formal training" (1:44). The study did show, however, that phonetic training tends to slow up oral reading but to promote greater accuracy. There was no evidence, on the other hand, of decreased efficiency in silent reading.

The results of the experiments referred to above agree in respect to the advisability of some phonetic training. There appears to be differences in the findings of Gates and Russell and of Agnew concerning the value of large amounts of such training. It is impossible to determine from the evidence available whether these differences are due to variations in the amount or kind of training offered or to other aspects of the total reading program provided.

Merits of Different Procedures in Beginning Reading. Several studies related to the merits of different procedures in teaching beginning reading. Houston (57) presented evidence of more progress in reading in the case of equated first-grade groups with whom manuscript writing was used as contrasted with the progress of groups using cursive writing. Berman (9) studied the influence of the kinaesthetic factor, particularly

with slow learners, and secured evidence of the value of manual tracing. He concluded that Fernald and Keller were justified in assuming that "a defensible teaching method would utilize every sensory channel as each makes a natural contribution to the learning process" (9:198).

Jardine (61) compared the progress of equated 1B classes, one group using preprimers and the other using reading materials presented through the use of slides. When the Metropolitan Achievement Test was given it was found that the latter group made a higher average score. The advantages of the use of slides was greatest among the slower pupils. As pointed out by Jardine, this procedure involves a great amount of work on the part of teachers, but permits much adaptation of reading material to the needs of pupils. The fact that materials were adapted to pupil needs was doubtless of greater significance than the specific form of presentation.

Keener (64) described the non-oral method used in some of the Chicago schools and cited evidence concerning its value. Test results and observations showed that "pupils can learn to read at least as well by the non-oral method as by the oral method" (64: 292), and that they have a tendency to vocalize less. The data presented do not compare the progress of the pupils in other aspects of reading in the primary grades nor in all phases of reading in the upper grades. Wrightstone and others (126) compared the progress of eight "activity" and eight "non-activity" schools in speed and comprehension in reading and found that the former achieved results "essentially equal to the conventional program in the knowledge and skills that enter into reading comprehension" (126: 244) and in speed of reading, but superior outcomes in other objectives such as obtaining and interpreting facts and data. Whereas the investigators were confident that the activity type of school is distinctly superior to the conventional type, they recognize limitations in the data presented and indicate that the conclusions presented should be recognized as tentative.

Lee (71) used the metronoscope with classes in various grades for a portion of the reading period each day throughout a year. He reported that since the metronoscope has been introduced retentions in the first-grade have been materially reduced. Furthermore, the scores on standardized reading tests throughout the school are from 10.7 per cent to 94.8 per cent better for those receiving metronoscope training than for those not receiving such training. Unfortunately, the study considers only one method of improving the reading program that had pre-

vailed in the school system. It is, therefore, impossible to conclude that needed improvement in achievement could be secured best or only through the use of the metronoscope.

Growth in Beginning Reading. Boney (14) presents very interesting evidence concerning the awakening of reading ability and the nature of subsequent growth in reading. "This period of awakening or spurt is the time when the pupil makes rapid strides in learning to read" (14: 141). He points out the fact that pupils often remain at a given level in reading for a considerable period of time and then make very rapid progress. The spurts are more conspicuous in the case of pupils who begin reading rather late. The question on which he wishes further light is "whether or not the spurt would have come as early, or if it would have come at all, without several months of what appears to be valueless instruction" (14: 141).

Reading Vocabularies. Keen interest continues in the study of the different words included in reading vocabularies. Of major importance in this connection is the summary by Seegers (93) of 263 investigations relating to vocabularies at the elementary school level. Writing, reading and speaking vocabularies were considered and the major findings summarized under the following headings: vocabulary lists; vocabulary difficulties in subject fields or textbooks; relationship between vocabulary and certain other factors, such as intelligence and the language spoken in the home; growth in vocabulary; and aspects of testing. A second study of the survey type was made by Hebel (52). It was concerned specifically with the vocabulary of reading materials. As a result of an analysis of twenty-three previous studies she called attention to the following significant results of research in this field: "scientific appraisals of the vocabulary loads of many books in beginning reading"; "some information in regard to a common vocabulary"; "the number of different words which books contain"; "the average number of word repetitions"; and "the extent to which the vocabulary of one book is carried over into succeeding books."

Analyses of the vocabularies of beginning books in reading were reported by four investigators. Curtis (20) studied the vocabularies of ten pre-primer programs to identify a core vocabulary, if possible, and to determine the practicability of wide reading among beginners. As a result of his analysis he identified a list of 72 words of high functional value and concluded that through "systematic work on a core vocabulary and careful selection of units" wide reading is entirely practicable for

beginners. Hockett (55) presented data relative to the vocabularies of six primers and six first readers published very recently. His analysis revealed a continuation of the trend toward a restricted vocabulary burden at each level. Betts (10) analyzed the vocabularies of 39 recent preprimers, primers, and first readers. The chief outcome was a "cumulative vocabulary by levels." The study showed a surprisingly small number of words common to preprimers, primers and first readers. As an aid in directing attention to the words of greatest importance in beginning reading Stone (101) proposed a list of 150 words based on extended research. The rank of each of these words on five separate lists was reported.

Two additional studies at the elementary-school level merit emphasis. One relates to an elaborate investigation (116) now in progress under the direction of H. D. Rinsland which aims to identify the most frequently used words of children in each elementary grade. When completed the study will "establish the reliability of the count for each grade" and will "list all words of high frequency with the frequency of each word" (116: 159). Gates, Bond, and Russell (42) carried on an elaborate study among 600 pupils in Grades II to VI inclusive, to determine ability to work out the recognition, pronunciation, and meaning of thirty words from each of the twenty thousands of the Thorndike list. The study showed in general that "the first thousand words is slightly easier than the second," that "the successive thousands from the second to the tenth show increasing difficulty," and that "beyond the tenth thousand the increase in difficulty is slight. . . . Not until the sixth grade is reached do the pupils recognize half as many words in the tenth as in the first two thousand" (42: 167).

At the junior and senior high school levels, Curtis (19) reported the results of an elaborate analysis of the vocabulary of science textbooks. He found "that more than twice as many of the uncomprehended technical and non-technical words which pupils of junior and senior high schools encounter in their textbooks of science belong in the seventh thousand-word level" of Thorndike's 20,000 words "as belong in the sixth or any preceding level" (19: 115). The word-by-word analysis of thirty textbooks in science led to the conclusion that the "vocabularies are too difficult for the pupils for whom they are written" and "that too large a percentage of the difficult words found in such textbooks of science are not defined." These findings led to the recommendation that the number of scientific terms introduced in science textbooks should be

greatly reduced and that all technical and nontechnical words above the sixth thousand in the Thorndike list should be defined. Curtis also identified the scientific terms which according to his criteria were of sufficient importance to merit mastery by pupils of general science, biology and chemistry.

At the adult level, The Works Progress Administration (125) developed a graded word list in four levels for use in the preparation of reading materials for adult education "in the foundation fields." The validity and reliability of adult vocabulary lists was considered by Horn (56). His study led to the conclusion that "we have accumulated very dependable data on the four or five thousand words most permanently, most frequently, and most universally used by adults" (56: 138).

A study by Dolch and Dolch (28) verified the prevailing impression that the Bible is relatively easy reading material. His analysis showed that almost half of the words in the Gospel of St. Mark are in the oral vocabulary of pre-school children and that "nine out of ten are known to grade school children." He concluded that "all *can* read the Bible—if they will" (28: 298).

Studies of Concepts and Meaning Vocabularies. Increasing interest has been expressed recently in the analysis of the concepts represented by words in different types of reading material and in problems relating to the acquisition of a meaning vocabulary. As a result of a concept analysis of seven pre-primers and six primers, Sims (95) pointed out the fact that many of the words included were used to represent more than one concept or meaning. It follows that the meaning of a word may be only partially known after its recognition has been thoroughly mastered. Meighen and Barth (80) examined ten recent third-grade readers and found that a large amount of geographic material had been included. They concluded that "many of the stories in third-grade readers would not be especially meaningful to children unless they knew something about the location and the environmental features of the regions introduced" (80: 301). Supporting evidence for the view just expressed was secured by Herbers (53) who studied the difficulties encountered by 30 pupils in comprehending a third-grade reader.

Concerning the methods used in deriving meanings in reading Looby (75) found that the context was used widely and that proficiency in deriving correct meanings was correlated closely with the mental ability

and environment of pupils. In an investigation of the influence of Latin on word knowledge, Pond (88) secured evidence that intelligence was closely associated with vocabulary knowledge on the part of those who had studied Latin. As a result of a controlled experiment Tate (106) found that large gains can be made in the meaning vocabularies of upper grade pupils in a half year and that a study of root words is very helpful in this connection. Curoe (18) secured evidence that directing attention of college seniors for three minutes daily throughout a semester to a short list of selected words with emphasis upon their meanings is of great value. Such findings justify the recommendation that definite attention be given at all educational levels to the enrichment of the meaning vocabulary of the learner.

The administration of the Michigan Vocabulary Profile by Greene (48) to more than 1600 students in Grades IX, XII, and XIV revealed three highly significant facts: vocabulary mastery increases more or less regularly throughout the grades represented; the scores on the tests were significantly higher for men than for women in most of the subjects represented; and the correlations between the scores on the different divisions of the tests (human relations, commerce, government, physical science, biological sciences, mathematics, fine arts, sports) were all below .55, the average being .30. Greene concluded from these findings that the vocabulary of each division included variables not found in those of other divisions. Other data indicated that there is not a "single vocabulary factor in the persons tested but rather a number of somewhat isolated patterns" (48: 389).

In order to test the validity of the assumption that familiarity with words is relatively stable over a period of time, Dale and Weedon (21) gave 50 business terms to groups of seventh and eighth grade pupils in 1928, 1932, and 1937. The correlations between the results of the different tests were all high. There was greater change, however, in pupils' understanding of the terms during the four-year period from 1928 to 1932 than during the five-year period from 1932 to 1937. After considering the implications of their study, the investigators concluded that "the testing of the familiarity of words in varied areas of living probably has a sociological significance hitherto unused by workers in this field" (21: 144).

Value of Workbooks. In response to many requests for opinions concerning the value and use of workbooks, The Association for Childhood Education in Washington carried on a questionnaire study (12) among

43 supervisors and principals and a much larger number of classroom teachers. The reports indicated, among other items, that in a large majority of the situations represented, workbooks are used more or less regularly, that in the judgment of supervisors and teachers more would be used if they were available, that they should be used at assigned or regular periods in Grades I, II, and III, that they are of greater value in teaching pupils to read than in keeping them busy or quiet, that they are of greater value in helping detect reading difficulties than in remedying them, and that the chief objections to reading workbooks are that they are too expensive in time and effort for the value received, are too stereotyped or standardized to meet the needs of children, and require too much supervision. The value of the report was greatly increased by a section dealing with prevailing assumptions and beliefs underlying the acceptance of workbooks and by a series of questions relative to the value of workbooks in facilitating the learning process.

Less favorable information relating to the value of workbooks was secured in two experimental studies. Gates and Russell (43) compared the progress of two groups, the former making use in beginning reading activities of both a primer and elaborate workbook materials and the latter using the primer only. Their findings indicated a slight but persistent advantage in favor of the former group. However, the differences were not statistically significant. Motter (83) compared the value of teacher assignments and workbook assignments in social studies classes at the secondary-school level and found that neither is notably superior to the other method. The fact that both of these experiments related to highly specific situations may account in part for the difference in findings as compared with those of the American Childhood Association study. It is quite possible, on the other hand, that the prevailing judgments of teachers and supervisors should be checked experimentally.

Oral Reading. Investigators expressed increased interest in oral reading problems during the last year. In order to determine the extent to which reading difficulties in the primary grades persist in Grades IV and V, Daw (22) secured records from 100 pupils in each of the latter grades. His data showed that whereas the pupils of the fifth grade made fewer mistakes than those in the fourth, the errors which headed the list in the fifth grade corresponded closely with those which occurred most frequently in the third-grade. The "oral-reading demons" according to Daw are inadequate word mastery skill, poor enunciation, errors on small words, inadequate phrasing, and lack of expression. As shown by

Moss (82) speech defects are a definite handicap to oral reading in the second-grade. She concluded that "the majority of speech defects among second-grade pupils of average intelligence and chronological age are due to faulty habits and could be overcome in time, with proper supervision and corrective methods, both at home and at school" (82: 654).

Organization of Instruction to Provide for Group and Individual Needs. Much evidence was reported during the year which supports the conclusion that pupils can be classified to advantage into homogeneous groups for purposes of instruction in reading. For example, Kiesling (65) reported favorably on the advantages of classifying first-grade pupils into three groups on the basis of their I.Q.'s; Kvaraceus and Wiles (68), on the superiority of classifying second-grade pupils on the basis of scores on the Metropolitan Achievement Test (Reading, English, and Spelling) and the judgments of teachers as compared with heterogeneous grouping; O'Bannon (85) on the value of classifying third, fourth, fifth, and sixth grade pupils in terms of scores on the Gates Silent Reading Tests; and Martin and Rochefort (77) on the value of classifying sixth and seventh grade pupils in terms of scores on the same test. The results of all these studies were conclusive concerning the value of some form of grouping to reduce variations in the attainments, capacities and needs of the pupils taught in given classes.

Reading in the Content Fields. In harmony with the recommendations made by two recent national committees problems relating to reading in the content fields have received increasing emphasis during the past year. Reference will be made first to studies of textbooks. Treacy (114) reviewed briefly recent efforts to improve the construction and selection of textbooks and emphasized their great value as instruments for molding attitudes. He also cited evidence of the value of recognizing pupil interest in selecting books. Dolch (27) analyzed the fact burden in elementary school textbooks in geography, history, science, and health and found wide variations in their difficulty. Because of the significance of his findings, he urged that future studies of reading difficulty make wider use of data relating to fact burden. Strickland (102) carried on an exploratory study in Grades I to IV, inclusive, to determine the types of graphs that are intelligible to children at these levels and the minimum instruction necessary. His findings showed that a very large majority of the pupils tested were interested in graphs, that above the first grade the difficulties encountered in reading them were surprisingly few, and that the expressed preferences of the pupils "placed the developmental

picture chart in first rank at each grade level, followed by the unit pictograph, circle graph, line graph (for grades III and IV only), bars and figures, and last of all bars on a grid'' (102: 114).

The fact is widely recognized that ability to read is a significant factor in scholastic achievement. During the past year, Read (89) reported a correlation of .41 between reading comprehension and first-semester average in a municipal university. In harmony with findings reported earlier, rate of reading was of far less significance than level of comprehension. In an extended study of reading and ninth-grade achievement, Bond (13) found that ''varying degrees of relationship exist between the several aspects of ability in reading and composite ninth grade achievement. Ability in composite comprehension, in location of information, and in power of comprehension are all highly significant factors in composite ninth grade achievement.'' (13:56) Her data showed also that slow readers are at an advantage in composite achievement, but that rapid reading is ''a definite help in enlarging vocabulary and broadening literary acquaintance'' whereas a slow rate of reading ''is characteristic of high achievement in science, mathematics and Latin'' (13:58). As implied by the foregoing statements ''varying degrees of relationship exist between the several aspects of reading and each of the various ninth grade subjects'' (13: 56). These findings support the contention that all teachers should make special effort to promote the development of those reading habits which are of greatest value in achieving the ends sought in their respective subjects.

Evidence of the value of specific guidance in reading was presented by various investigators. As a result of statewide effort in Iowa to improve work-type reading in different content fields, Bennett (7, 8) reported gains significantly above average expectancy in grades IV to VIII inclusive. Phipps (87) found as a result of an experiment in six sixth-grade classes that ''ability to read history can be improved by giving attention to the development of a meaningful vocabulary in history'' (87: 22). Stright (103) presented clear evidence ''that a definite relation does exist between a student's ability to read with comprehension and his skill in solving algebraic problems'' (103: 372). As a result of a controlled experiment in freshmen high school classes he found that ''a better knowledge of reading mechanics does increase a student's comprehension,'' that this increase in comprehension ''does carry over into the student's ability to solve algebraic problems'' and that ''word meaning should be stressed in the teaching of algebra'' (103: 372). Clark

(15) likewise secured evidence of a significant relationship between reading comprehension and algebraic achievement, also that remedial instruction resulted in better reading achievement "which in turn effected a higher coefficient of correlation with algebraic achievement" (15: 67).

In the field of English, Hovious (58) presented evidence of the value of teaching reading and writing (or speaking) in the high school as complementary arts. "The problems of the reader (consumer) and the problems of the writer (producer) went hand in hand. The reading project was, in each case, the point of departure, leading to further reading to produce a radio program, a panel discussion, a diary, a book, a newspaper, or an assembly program. . . ." (58:838). Heaton (51) demonstrated the value at the college level of wide informal reading in connection with a core curriculum in increasing the literary acquaintance of students and their reading efficiency. Through the use of special tests designed to measure comprehension of plot, character, and social and ethical values in twelve classics, Crawford (16) found wide variations in the achievement of secondary school pupils in long term and in short term schools. Her data also showed wide variations in the achievement of each grade group and much overlapping in all grades. She recommended a more careful selection of classics in terms of the reading abilities of the pupils taught.

Relation of Intelligence to Basic Factors in Reading. Using the Kuhlman-Anderson Test and the Myers Mental Measure as bases of classification, Leavell and Sterling (70) secured correlations between intelligence and such basic factors in reading as number of fixations, number of regressions, duration of fixations, span of recognition, rate and comprehension. The records secured showed "a fairly marked tendency for the less intelligent children to make more regressions than the more intelligent" (70: 154). When the Kuhlman-Anderson Test was used significant differences were found in the median scores of the superior and inferior intelligence groups "in the number of fixations per hundred words of reading material, the number of regressions per hundred words, the span of recognition and the rate of reading" (70: 154-55). The statement should be added that the coefficients of correlation between rate of reading and intelligence varied with the tests used. Furthermore, the differences between the superior and the average intelligence groups was greater in more of the basic factors when the Kuhlman-Anderson Test was used than when the Myers Mental Measure was given.

Comparisons of Good and Poor Readers. Several investigators were concerned with differences between good and poor readers in respect to certain basic factors in reading. Stromberg (104) secured eye-movement records of a group of fast and a group of slow readers at the college level. His data showed that the latter made more fixations and consequently more eye-movements in reading than did the former. On the other hand, he found no consistent differences between the two groups in divergent movements during fixations and convergence movements between fixations nor in the proportions of fixations and corrective movements for the types of reading materials used.

Crosland (17) compared superior and inferior elementary school readers in letter position and range of attention scores. The investigator's "letter position, 'range of attention,' tachistoscopic test" and various tests of eye-dominance were used. The tachistoscopic tests showed "that the superior readers excel the defective readers in the left visual field. The inferior readers excel the superior children in the extreme right visual field. Generally, without regard to letter position the superiors excel the inferiors. Hence, the right-field superiority of the defectives is all the more remarkable" (17: 426). The eye-dominance tests showed "a majority of defective readers to be left-eyed and a larger majority of superior readers to be right-eyed." He concluded that "left-eye dominance has some kinship with defective reading, although it appears that there are other causative factors leading to poor skill in this important activity" (17:427).

In a study of 52 stutterers and 56 normal speakers Moser (81) secured evidence that stuttering is often accompanied by lack of control of the muscles of the eyes. He interpreted his data as supporting the view that "stuttering may be a generalized neuro-muscular derangement and may account for certain reading disabilities" (81: 139). Further evidence of the validity of this conclusion is needed.

Comprehension and Related Factors. Acting upon the assumption that "there are gradations of comprehension of even a very simple idea," Feder (36) prepared and gave to college students a so-called comprehension maturity test. An analysis of the scores revealed two apparently distinct types or attitudes of reading with a third type indicated, namely, reading for information, reading for inference, and certain differentiating characteristics of reading for appreciation. The analysis also revealed "a marked tendency for most individuals to react quite consistently upon that level of response which characterizes the quality of their insight" (36: 605).

Evidence that difficulty of material influences comprehension was presented by both Walker (117) and Tinker (110). Walker's study showed also that "most of the deviations from normal observed in the good reader occurred under changes in the requirement of comprehension" (117: 480). Furthermore, Flanagan (39) pointed out that increasing rate of reading decreases comprehension scores. Obviously, the degree of comprehension is influenced materially by the purpose of reading, by the demand made upon the reader, by the difficulty of the material read, and by the rate of reading.

Concerning the correlation between rate of reading and comprehension Tinker (110) found that it is high in the case of easy material but decreases steadily as difficulty increases. He concluded that there is some indication that "type of material including kind of response required in the reading test also affects the correlation between speed and comprehension" (110:94).

Speed of Reading. In a study involving college students Arnold and Tinker (3) found that the briefest mean pause of the eyes in silent reading is longer than the exposure needed for "a well cleared-up perception." Among the factors involved in determining the duration of the shortest possible pause the following were emphasized: "(1) divergence of the eyes during the pause after the convergence that occurs in saccadic movements; and (2) reaction time of the eyes" (3: 279). The longer fixational pauses in reading "may be explained in terms of the requirements for comprehension and assimilation of the materials read" (3: 280).

In a study of the causes of slow reading, Sisson (97) identified the following factors as significant determiners of individual differences in reading ability: intelligence, or the ability to comprehend the written word; perceptual span or word perception; and the "attitudinal and conative determiners of the kind and amount of product or bi-product of the reading." Of these he directed attention particularly to the third. He described the slow reader as a careful, detailed reader, and maintained that the good reader is characterized by "a plasticity and facility of change in mode of attack to meet the requirements of the particular situation" (97: 211).

Considerable effort has been made during the past few years to improve efficiency in reading, and particularly speed, through the use of instrumentation. Dodson (26) reported evidence of the value of the use of the metronoscope in all elementary grades and Weber (118)

presented evidence of the value of using a tachistoscope in quick perception exercises with college students. Approaching the problem quite differently Sisson (96) compared the progress of two groups, one of which received specific training in eye-movements through the use of materials that designated the fixation points. The other group received an instruction sheet which stressed the need of increasing the speed of reading and indicated that improvement would result from reading under proper conditions of concentration and motivation. A comparison of the progress of the two groups led to the conclusion that training eye-movements is no more effective in respect to speed of reading than mere reading with intent to improve. Since this method may direct the reader's attention to the mechanics of the reading process, it may also "detract from the understanding of what is read" (96: 40).

Reading Interests. The studies reported relate largely to three issues: reading interests and preferences of children and adults; the evaluation of leisure reading; and methods of stimulating reading and elevating reading tastes.

Approximately 200 studies of the reading interests of elementary and high school pupils have been published to date in this country. Kramer (66) presented a summary of those which seemed to contribute "to a better understanding of how best to direct the reading interests of children toward the formation of more permanent and discriminating tastes and to help them to acquire a knowledge of the usefulness of books" (66: 311). One of the striking facts revealed is that although liveliness, animalness, humor, and conversation are important interest determiners among young children, no one quality is largely responsible for interest in reading. A second fact is that interest in the reading of books increases rapidly during the grades but decreases notably at the high school level. This fact calls for searching study of the influence in this connection which secondary schools exert. A third fact is that intelligence and environmental factors influence both the amount and kind of reading which children do; to a less marked degree, sex also influences reading interests.

Three studies of reading interests at the high school level merit emphasis. Rothney and McCaul (91) made a study of the preferences of 306 eleventh-grade college-preparatory boys. The reports showed clearly that they had a liking for materials dealing with the contemporary scene and for literature that related closely to their lives. They expressed dislike for histories of literature, thus indicating "that

the factual, analytical, history-of-literature approach is not conducive to generating an interest in literary works" (91: 659). Levi (72) secured information from several hundred studies in grades VII to XII, inclusive, to determine if pupils tend to become more news-conscious in succeeding years. The data indicated that the tenth grade ranked lowest of all the grades studied in newspaper reading and in interest in current events. One explanation offered relates to the fact that many of the students studied changed to a new school at the beginning of the tenth grade thus introducing a distraction. The evidence presented justified the conclusion that teachers should encourage more reading of current events throughout the secondary school period. Additional information concerning the nature of the problem at the high school level was presented by Emery (33) who found that 66 percent of 4,507 juniors and seniors listed no books read and 16 percent indicated no reading of magazines during summer vacations.

In a study of the poetry preferences of junior high-school pupils, Kangley (63) found that the characteristics of the best liked poems were: "a clear rhyme scheme, simplicity, dialogue, obvious sound effect, story element, humor, and relation to common experience" (63: 141). The differences in the preferences of the best readers and poorest readers were very significant, the latter preferring poems classified as "obvious sound effects" and "obvious humor." The former tended to select poems falling in the less popular subdivisions. That interest in poetry can be cultivated was demonstrated by Gillett (46) who carried on studies with grade children. Her experiments led to the conclusion that "there are specific techniques in teaching poetry, varying in effectiveness, but all contributing to an increased interest" (46: 16).

The results of studies of reading interests at the adult level are also very illuminating. Krieg (67) made an analysis of the library circulation during a four-week's period in a middle-western manufacturing community. The study showed that children borrow more books than adults, that girls borrow more than boys, that men borrow about as many books as women, and that students and housewives use the library more than any other class. Of the total circulation, fiction represented 71.9 percent. Whereas accessibility is a vital factor there is a "dead spot" between easy walking distance and more remote centers from which people come by car or bus.

Evidence of the extent to which certain popular magazines are read or seen was presented in research bulletins published by *Life* (74). On

the basis of 13,045 interviews to determine the number of people who read or look into a typical issue of *Collier's, Liberty, Life,* or *Saturday Evening Post,* it was found that 56.8 percent of our population above nine years of age, or 60,900,000 people, see one or more of these magazines each week. This finding corresponds closely with data presented previously to the effect that about half of the people in this country read or look at magazines. The fact is also well known that the amount of leisure reading differs among different occupational groups. In this connection, Wilcox (119) pointed out that faculty members read far less, other than required professional reading, than might be expected. The explanation offered was that heavy responsibilities made wide leisure reading impossible for a surprisingly large percentage of them.

The evaluation of the leisure reading of pupils presents challenging problems at all levels. In this connection the Eight-Year Study of the Progressive Education Association has developed four assumptions concerning the pupils' reading experiences. As proposed by Eberhart (32) they should be of such a nature that the pupil is stimulated "(1) to read extensively, (2) to read various types of fiction and non-fiction, (3) to read books of gradually increasing maturity and complexity, and (4) to develop special interests in various fields of knowledge and various types of literature" (32: 258). The application of these criteria is illustrated in Eberhart's report. Through the use of the techniques described the teacher "may come to a realization of the successful aspects of his work and of the points at which change in emphasis or direction is advisable" (32: 268).

Various methods of cultivating reading interests and tastes were reported. Lawshe (69) emphasized the value of a shift from "intensive to extensive reading, from teacher-chosen classics to pupil-chosen materials and from reading for knowledge to reading for experience and pleasure" (69:21). Rosenbaum (90) reported favorably on the values secured through highly motivated conference periods in library reading. Similarly Hancock (50) described the results of two periods each week in an auditorium devoted to stimulating lectures on various types of literature, supplemented by actual reading during three class periods each week of the types of literature discussed in the auditorium. Erickson (35) emphasized the importance not only of providing an abundance of interesting, attractive literature but also of providing guidance that will develop interest in and appreciation of the best literature suitable to the reading interests of children.

Remedial Reading. The term remedial reading has been used increasingly during recent years to refer to the corrective work undertaken by schools with groups or individuals who are retarded in reading. Following an extended survey of recent literature in this field Traxler (112) concluded that the research done thus far relates to six specific aspects of the problems: objectives of such training; identification of retarded readers; the diagnosis of difficulties; organization of instructional groups; remedial procedures; evaluation of progress. On the basis of the evidence reviewed, he concluded that the status of poor readers can be greatly improved through "skillful classroom teaching." As a result of a survey of 54 recent publications concerning diagnosis and remedial teaching Tinker (107) reached the hopeful conclusion that when proper methods are adequately applied "reading handicaps can be largely overcome or entirely eliminated" (107: 301). The results of specific studies published during the year support this view.

In an experiment at the elementary school level, Dimmick (25) studied the effect of reorganizing a school from a platoon type to a remedial type organization. Three principles were observed in effecting the reorganization: the case method was employed in the study of children's needs; through an enriched school program every pupil was given equal opportunity to go through the same cycle of experiences; instruction was offered on differentiated levels so that each child "would be stimulated to work up to his capacity but always on the level of his own ability" (25: 94). As compared with the control groups, those in the experimental classes made far more satisfactory progress. Johnston (62) organized an experimental program in grades IV to VIII inclusive which involved the careful study of the needs, interests and reading ability of pupils, help in identifying materials that could be read eagerly and with a purpose, and guidance in overcoming specific difficulties encountered. As a result of an experiment involving all elementary grades Fitzgerald (38) concluded that diagnosis should be continuous, that remedial work should begin at the level of understanding of the pupil and should be increased "gently but surely," that it should be organized to meet "new interests and growing abilities," and that it should be "preventive as well as curative" (38: 110). Even when organized on a state-wide basis, remedial reading may be very productive, as shown by Bennett (7).

As a result of three years of experimentation Drake (29) found that remedial reading for pupils with I.Q.'s of 90 or below and who were

one or more years retarded in reading brought about substantial improvement for many pupils. Although most of the activities were centered at first in the hands of reading specialists, the program expanded later so that it was integrated closely with practically every subject in the junior high school. McGaughan (78) reported favorably upon the results of special instruction for groups of poor readers in Textile High School which included both wide independent reading and specific guidance on reading problems encountered in assigned units. Scarlet (92) found that by organizing remedial classes and placing them under the direction of W.P.A. teachers, significant improvements were made.

The results of experiments at the college level are equally encouraging. McNeil (79) at the Kansas State Teachers College, Bear (5) at Dartmouth and Smith (98) at Indiana State University secured evidence of the value of a vigorous attack on the reading difficulties of students in their respective institutions. Two important factors influencing success in each of these studies were definite knowledge of the needs of students and appropriate guidance under the direction of informed and sympathetic teachers.

Although notable improvement was secured in all the experiments conducted during the year, Witty (124) vigorously challenged the adequacy of current practices in remedial reading. He maintained that they are far too narrowly conceived, and "should be reoriented in terms of larger considerations and aims" (124: 92). In his judgment, remedial instruction must aim to help the child adapt himself better to his school and social environment.

The fact that remedial instruction proves very valuable at practically all grade levels justifies the criticism that the patterns of teaching normally employed are not as effective as they should be. There is urgent need for more detailed studies of the needs of pupils and far more effective adaptation of the types of guidance provided to their varying needs, interests, and abilities.

Causes of Reading Retardation and Disability. The causes of reading retardation and of extreme cases of reading disability have attracted wide attention during the past year. The fact that many factors are associated with reading disability is emphasized by most investigators. For example, Lichtenstein (73) presented case studies which showed clearly that different factors and conditions operated in each case: in one of them the most obvious causal factors were poor visual perception and low phonetic ability; in a second case, the difficulties appeared to be

wholly physiological, including poor motor coordination and a markedly defective neurological mechanism; in a third case, the difficulty was explained in terms of the need for more effective methods of promoting associative learning.

Without doubt the most elaborate study published recently concerning the causes of poor reading was made by Bennett (6) who first summarized evidence concerning factors associated with reading disability. He found (a) that although low intelligence is without doubt one of the most important causal factors, cases of reading disability often occur among pupils with average intelligence or above; (b) that available data do not justify the conclusion that there is a general sex difference in reading ability in spite of the fact that more boys are reported for remedial treatment than girls; (c) that "occasional reading disabilities result directly from physiological or neurological defects and that more frequently such conditions exert a contributing or aggravating influence" (6:15); (d) that "various types of visual dysfunction may sometimes contribute to difficulties in reading" (6: 17); (e) that adequate auditory functioning is very important and that a careful adaptation of instruction is necessary to meet the needs of children deficient in this respect; (f) that "hand and eye preferences are unreliable as indices to reading achievement," that "handedness alone appears to have little or no significance," and that crossed dominance appears "with disproportionate frequency among poor readers" (6: 26). Other factors, such as home background and personality and behavior characteristics, were found also to be associated with difficulty in reading.

Comparisons of average and poor readers led Bennett to the following inferences or tentative conclusions: (a) that "the position of eldest child in the family is propitious to good reading"; (b) that "children with a history of speech defect seem liable to failures in reading"; (c) that poor readers are regarded "as lacking in persistence and in the capacity for sustained and concentrated attention"; (d) that the tendency to pursue a somewhat inactive and solitary life "rather than a physically vigorous and gregarious one" is more characteristic of poor readers than of good readers; (e) that "poor readers tend to regard the school situation as rather unpleasant and difficult to face," and (f) that "poor readers tend to regard themselves as somewhat inadequately fortified in facing life's difficult situations" and are more or less subject to "crying spells, fears, indecision, headaches or loneliness" (6: 122). These statements support the conclusion of Witty, referred to earlier,

that the problems faced by the poor reader are quite diverse and often require steps leading to better adjustment both in and out of school.

Whereas, it was earlier believed that poor readers suffered from some sort of innate deficiency, the view now prevails that the causes of reading disability must be sought elsewhere. For example, Gerstmyer (45) found as a result of diagnostic studies in the primary grades that "the so-called extreme non-readers are usually suffering either from a physical defect or from poor teaching technics and not, as previously believed, from innate deficiencies" (45: 402).

Relation of Visual Factors to Reading Disability. Several investigators were especially concerned with the influence of visual factors on reading disability. Dearborn and Anderson (24) concluded from a study of 100 cases of severe reading disability and 100 control cases that aniseikonia may contribute "to the cause and persistence of reading disability." In a study of 350 poor readers with a median grade index of 3.6 Eames (30) found that one-third had refractive errors of 1.00 or more diopters, that about one-half exhibited incoordination difficulties at the near point, that about one-third were deficient in fusing twelve point type and that from a fourth to a third had restricted central visual fields. On the basis of the evidence secured he concluded that many poor readers need medical or optical attention. In another study involving 100 poor readers and 50 who encountered no reading difficulty, he found that the former "tended to exhibit slower speeds of both picture and word recognition and therefore of the speed of recognition in general" (31: 1375). Because the children "without reading trouble but with eye difficulties tended to be slower in the speed of recognition than did a group of 20 school children who were without eye or reading trouble" he concluded that "eye defects may retard the speed of recognition." (31: 1375).

Several investigators presented data which led to somewhat different conclusions from those given above. Imus, Rothney and Bear (60) grouped college students on the basis of their diagnosis of ocular defects but found no "significant differences among them in *performance* on reading tests, eye-movement camera records or academic points" (60: 121) or in improvement during a college year. Even the correction of defects does not guarantee improvement. The fact is significant, however, that 83 percent of those receiving ocular correction believed that they were helped. Without doubt the fact noted in many of these cases was relief from discomfort. In a study of the relation of lateral muscle

balance to the convergent and divergent movements of the eyes during reading, Stromberg (104) found no clearly defined differences between fast and slow readers.

Reading Tests. A considerable amount of interest has been shown recently in the development of improved types of reading tests. For example, Englehart and Thurstone (34) described the nature, organization, validity and reliability of the Chicago Reading Tests prepared for use in various elementary school grades. A basic assumption underlying these tests is that their content must harmonize with that found in the school curriculum. Feder (36) discussed the nature of the Comprehension Maturity Tests, which are based on the assumption that there are gradations of comprehension of even very simple ideas. The data presented indicate that reading for information and reading for inference are relatively independent; on the other hand, reading for appreciation bears a close relationship to reading for inference although there are differentiating factors involved.

Several investigators reported data which throw light on factors influencing the reliability and validity of reading tests. Traxler (111) pointed out, for example, that a speed of reading test which continues for 400 seconds is much more reliable than one for only 300 seconds or less. Flanagan (39) emphasized the fact that the terms speed and comprehension must be defined explicitly in any effort in the future to develop valid measures of these aspects of reading. Tinker (110) presented evidence supporting the contention that speed and comprehension are affected by the level of difficulty of the materials read. Furthermore, in a study involving both English and Spanish speaking children, Mahakian (76) found that tests administered to the latter "are not valid in the first three grades and in atypical classes and should not be used as a means of comparison between English-speaking and Spanish-speaking children" (76: 768). The results of such studies justify the assumption that far more discriminating criteria should be vigorously applied in developing tests in the future than has been true in the past.

In order to determine the consistency with which the various reading tests used by the Educational Records Bureau, New York City, measure the same students from year to year correlations were found between the scores for the same pupils on two successive years. "In all cases except two, the coefficients of correlation are above .70." It was found also that "the Haggerty and Sangren-Woody tests have a correlation of .767; the Sangren-Woody and Traxler tests have correlations of .69

and .705; and the Traxler and Iowa Tests (for total comprehension scores only) have a correlation of .797" (94: 59).

Visual Tests. As the relation of vision to reading has been recognized with increased clarity, greater attention has been given to the development and validation of visual tests that can be used in identifying pupils with visual defects. In this connection Hildreth and Axelson (54) developed an adaptation of the Snellen chart "that capitalizes the child's interest in games and elicits responses that are pleasurable and natural" (54: 229-30). Betts (11) reported "previously unpublished data on the reliability and validity of the readings taken on the lateral imbalance slide of the Visual Sensation and Perception Tests of the Betts Ready to Read Battery" (11: 1). Both the limitations and implications of the data were considered. Oak (84) attempted to appraise the Betts Visual Sensation and Perception Tests by comparing the results secured by school nurses on the Betts tests with those secured by the school staff opthalmologist. A comparison of the results of the two types of examinations led to the conclusion that the Betts tests "sorts out too many cases for practical purposes, and also that it misses cases needing to be referred for ocular attention" (84: 250). This conclusion is based on the assumption that the findings of the opthalmologist were accurate. No supporting evidence was presented.

Hygiene of Reading. Studies relating to two problems in this general field were reported. Alderman (2) carried on studies in Grades I to VI, inclusive, to determine the effect of size of type on speed of reading. He found that in the lower grades 8 point type was read more rapidly than 10 point, 12 point and 14 point type. The smaller type was also distinctly superior in the upper grades. He also found little or no difference in the relationship between speed and size of type for pupils of different levels of intelligence. Through the use of the Betts telebinocular tests he secured evidence that all pupils who have eyes which are good enough to engage effectively in school work in general read the smaller type more rapidly than the larger type. Unfortunately, the speed tests were of short duration and did not take into consideration the factor of fatigue. Furthermore, the influence of size of type on accuracy of word recognition and discrimination in the early stages of learning to read was not studied.

Various agencies have been deeply interested in the amount of light necessary "for effective and comfortable vision." After considering all the evidence available Tinker (109) concluded that "the critical level

for reading is between 3 and 4 foot-candles." To provide a margin of safety no reading should be done with less than 5 foot-candles of light; in school rooms in general, the minimum "should probably not be less than about 10 foot-candles"; in sight-saving classes "the brightness should probably be 20 to 25 foot-candles" (109: 18).

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23. Dean, Charles D. "Predicting First-grade Reading Achievement," *Elementary School Journal*, XXXIX (April, 1939), 609-16.
Considers relative predictive value of visual acuity, mental age, and readi ness-test scores, isolated or in combination, for 116 first-grade entrants.

24. Dearborn, Walter F., and Anderson, Irving H. "Aniseikonia as Related to Dis ability in Reading," *Journal of Experimental Psychology*, XXIII (De cember, 1938), 559-77.

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25. Dimmick, Earl A. "An Appraisal of an Elementary School Reorganization in Terms of Its Effect upon the Children Who Attend It," *Journal of Educational Research*, XXXII (October, 1938), 91-101.
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26. Dodson, P. J. "A Modern Program of Reading Instruction in a Public School System," *Peabody Journal of Education*, XVI (November, 1938), 175-80.
Reports data on the effectiveness of employing the Opthalmograph and Metronoscope as part of the regular reading program in the first six grades.

27. Dolch, E. W. "Fact Burden and Reading Difficulty," *Elementary English Review*, XVI (April, 1939), 135-38.
Presents findings of a tentative study regarding the "fact" burden of school textbooks, with comparisons of books from first- to sixth-grade levels, dealing with geography, history, science, and health.

28. Dolch, Ida C., and Dolch, E. W. "The Bible is Easy Reading," *Elementary English Review*, XV (December, 1938), 297-98.
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29. Drake, C. Elwood. "Reading and Remedial Reading in a Junior High School," *Bulletin of the Department of Secondary-School Principals*, XXIII (March, 1939), 100-11.
Presents gains made by 103 mentally capable reading retardates at the junior high school level following five months of intensive reading instruction.

30. Eames, Thomas Harrison. "The Ocular Conditions of 350 Poor Readers," *Journal of Educational Research*, XXXII (September, 1938), 10-16.
Presents data from 350 poor readers showing frequencies and central tendencies with respect to "visual acuity, refraction, co-ordination of the eyes in distant vision and in near vision, the amplitude of fusion convergence for twelve-point type, ductions, central fields, and lateral dominance."

31. Eames, Thomas H. "The Speed of Picture Recognition and the Speed of Word Recognition in Cases of Reading Difficulty," *American Journal of Ophthalmology*, XXI (December, 1938), 1370-75.
Compares the speed of word recognition and picture recognition for 100 pupils having difficulty with reading and 50 cases without reading difficulty. Comparisons involving those with and without eye difficulties were also made.

32. Eberhart, Wilfred. "Evaluating the Leisure Reading of High-School Pupils," *School Review*, XLVII (April, 1939), 257-69.
Makes use of the "cumulative-record" technique of evaluating leisure reading to secure data on trends in amount of reading, types of books read, and types of non-fiction preferred by several hundred pupils in grades VII to XI.

33. Emery, Julia. "Vacation and Schooltime Reading," *English Journal*, XXVIII (June, 1939), 467-71.
Compares amount of reading and types of books, newspapers, and magazines read during summer, fall, and winter by 4,507 high school juniors and seniors.

34. Engelhart, Max. D., and Thurstone, Thelma Gwinn. "The Chicago Reading Tests," *Chicago Schools Journal*, XX (November-December, 1938), 74-81.
Describes the nature of the reading tests and the steps taken in standardizing them; reports also preliminary findings concerning their reliability and validity.

35. Erickson, Marion Ihrig. "Developing Reading Tastes in Magazine Literature," *Elementary English Review*, XVI (January, 1939), 10-14.
Presents the outcomes of an experiment designed to improve the reading tastes and habits of 35 sixth-grade children.

36. Feder, D. D. "Comprehension Maturity Tests—a New Technique in Mental Measurement," *Journal of Educational Psychology*, XXIX (November, 1938), 597-606.
Describes construction of a measure of possible differences in maturity of reading comprehension of college students; factorial analysis of responses for 700 subjects reveals two distinct levels of characteristic response.

37. Fendrick, Paul, and McGlade, Charles A. "A Validation of Two Prognostic Tests of Reading Aptitude," *Elementary School Journal* XXXIX (November, 1938), 187-94.
Offers information regarding prognostic value of two reading readiness tests validated against a measure of reading achievement for 66 first-grade subjects.

38. Fitzgerald, James A. "An Experiment in Remedial Reading," *Catholic School Journal*, XXXIX (April, 1939), 108-11.
Describes a series of diagnostic and remedial procedures employed to aid 95 retarded readers in grades 4 to 8, and reports the gains made after 7½ months of training.

39. Flanagan, John C. "A Study of the Effect on Comprehension of Varying Speeds of Reading," *Research on the Foundations of American Education*, pp. 47-50. Official Report of the American Educational Research Association, 1939. Washington: American Educational Research Association, 1939.
Summarizes and interprets the results obtained by training about 300 twelfth grade pupils "to read and sense questions about certain rather difficult literary selections at three different rates."

40. Gates, Arthur I. "An Experimental Evaluation of Reading-readiness Tests," *Elementary School Journal*, XXXIX (March, 1939), 497-508.
Reports studies to identify reading readiness tests of greatest predictive value; points out factors influencing prognosis as revealed by extensive study of reading readiness and progress.

41. Gates, A. I., Bond, G. L., and Russell, D. H., assisted by Bond, Eva, Halpin, Andrew, and Horan, Kathryn. *Methods of Determining Reading Readiness*. (New York: Bureau of Publications, Teachers College, Columbia University, 1939), Pp. 55.

Reports the results of a series of experiments designed "to test the value of practically every type of test, rating, examination, or other means of appraisal which had then been suggested, or which the authors could think of, as a means of predicting reading progress."

42. Gates, Arthur I., Bond, Guy L., and Russell, David H. "Relative Meaning and Pronunciation Difficulties of the Thorndike 20,000 Words," *Journal of Educational Research*, XXXII (November, 1938), 161-67.
Presents findings of a study of 600 children in grades 2B to 6A inclusive to determine ability to recognize, pronounce, and give meanings of 30 words from each of the successive thousands of the Thorndike list.

43. Gates, Arthur I., and Russell, David H. "Types of Materials, Vocabulary Burden, Word Analysis, and Other Factors in Beginning Reading. I and II," *Elementary School Journal*, XXXIX (September and October, 1938), 27-35, 119-28.
Summarizes the results of a controlled experiment, including 354 first-grade pupils, to ascertain (1) the effects of using a large amount of workbook material in addition to that accompanying the basic primer used, (2) results of using material having vocabulary closely restricted to that of the basal reader as compared with use of material not so limited, and (3) results produced by varying amounts and kinds of phonic activities and word analysis.

44. Gates, Arthur I., and Russell, David H. "The Effects of Delaying Beginning Reading a Half Year in the Case of Underprivileged Pupils with I.Q.'s 75-95," *Journal of Educational Research*, XXXII (January, 1939), 321-28.
Offers tentative conclusions from an investigation of the value of delaying reading instruction for 20 pairs of dull-normal and border-line underprivileged children (I.Q.'s 75-95) just entering school.

45. Gerstmyer, Eva E. "Diagnosing Serious Reading Difficulties in the Primary Grades," *Newer Practices in Reading in the Elementary School*, pp. 397-402. Seventeenth Yearbook of the Department of Elementary School Principals, Bulletin of the Department of Elementary School Principals, Vol. XVII, No. 7. Washington: Department of Elementary School Principals of the National Education Association, 1938.
Describes a diagnostic and remedial reading program at the primary grade level; presents data showing effect of remedial treatment on a third-grade pupil.

46. Gillett, Norma. "Interesting Children in Poetry," *Elementary English Review*, XVI (January, 1939), 15-16.
Presents the results of an attempt to develop knowledge of and liking for poetry among 33 5A and 6B pupils.

47. Gray, William S. "Summary of Reading Investigations (July 1, 1937 to June 30, 1938)," *Journal of Educational Research*, XXXII (March, 1939), 481-517.
Summarizes findings and conclusions of 98 published investigations and reports pertaining to reading.

48. Greene, Edward B. "Michigan Vocabulary Profile," *Journal of Higher Education*, IX (October, 1938), 383-89.

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cabulary Profile, and norms for the ninth, twelfth, and fourteenth gra

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XXXIX (April, 1939), 593-603.
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data regarding the phonogram load found in 10 primary reading manu
with discussion of possibilities for simplification.

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Washington: Department of Elementary School Principals of the Nati
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by inadequacies and inconsistencies in responses to tests based on th
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229-36.
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Elementary School Journal, XXXIX (October, 1938), 112-15. Prese
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56. Horn, Ernest. "The Validity and Reliability of Adult Vocabulary Lists," E
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School Journal, XXXIX (October, 1938), 116-18.
Presents evidence on relative merits of manuscript and cursive writing based on the reading progress of sixty two first-grade pupils.

58. Hovious, Carol. "Reading in a Language Program," *English Journal*, XXVII (December, 1938), 831-39.
Presents data concerning the effect of a planned and motivated reading program on the language usage of forty-seven ninth-grade pupils as compared with gains in language usage of sixty-nine other ninth-graders following the traditional course.

59. Huggett, A. J. "An Experiment in Reading Readiness," *Journal of Educational Research*, XXXII (December, 1938), 263-70.
Presents data secured from seventeen to forty-eight kindergarten children, concerning interrelations between three reading readiness tests and an intelligence test, and the predictive value of the readiness tests.

60. Imus, Henry A., Rothney, John W. M., and Bear, Robert M. *An Evaluation of Visual Factors in Reading.* (Hanover, New Hampshire: Dartmouth College Publications, 1938), Pp. 144.
Reports methods and results of an elaborate study at Dartmouth College to determine relationships of certain visual conditions to disability in reading and to evaluate certain remedial procedures.

61. Jardine, Alex. "The Experimental Use of Visual Aids in Teaching Beginning Reading," *Educational Screen*, XVII (September, 1938), 220-22.
Reports progress of 1B pupils, eighty seven in a control group following the usual formal method of teaching, and ninety three taught by an experimental method featuring use of visual aids.

62. Johnston, Fannie B. "A New Point of View for Remedial Reading," *Educational Research Bulletin*, XVIII (May 3, 1939), 127-32.
Describes the procedures and results of a program of remedial reading for pupils in grades IV-VI, inclusive, incorporating "the theories and practices urged by mental hygienists."

63. Kangley, Lucy. *Poetry Preferences in the Junior High School.* Teachers College Contributions to Education, No. 758 (New York: Teachers College, Columbia University, 1938), Pp. xi + 153.
Presents findings concerning poetry preferences of 10 classes of eighth-grade children, with special reference to effect of varying ability levels, as shown by reading comprehension scores, on types of poetry preferred.

64. Keener, Edward E. "Teaching Primary Reading by the Non-Oral Method," *Elementary English Review*, XV (December, 1938), 291-92; 308.
Reports data on reading achievement of 127 first-grade children taught by the non-oral method.

65. Kiesling, Lethal G. "Adapting Early Instruction to the Individual Child," *Newer Practices in Reading in the Elementary School*, pp. 319-27. Seventeenth Yearbook of the Department of Elementary School Principals, Bulletin of the Department of Elementary School Principals, Vol. XVII, No. 7, Washington: Department of Elementary School Principals of the National Education Association, 1938.

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Summarizes studies of reading interests at elementary and secondary levels; points out contributions relating to methods of developing ability to choose and use books.

67. Krieg, Laurel. "Community Studies in Reading. IV. A Middle-Western Manufacturing Community," *Library Quarterly*, IX (January, 1939), 72-86.
Report results of a community survey of library circulation, involving comparisons of 2,477 readers classified on basis of sex, age, grade level or occupation.

68. Kvaraceus, William C., and Wiles, Marion E. "An Experiment in Grouping for Effective Learning," *Elementary School Journal*, XXXIX (December, 1938), 264-68.
Considers effectiveness in terms of reading achievement of grouping 75 second grade pupils on the basis of proficiency in three subject-matter fields.

69. Lawshe, C. H. "Free Reading in Evansville," *Nation's Schools*, XXII (August, 1938), 21-22.
Reports influence on total library circulation and on books withdrawn with the introduction of free reading in a high school English course.

70. Leavell, Ullin W., and Sterling, Helen. "A Comparison of Basic Factors in Reading Patterns with Intelligence," *Peabody Journal of Education*, XVI (November, 1938), 149-55.
Presents data for 191 sixth-grade children on the relation to intelligence of certain basic factors in reading, namely, comprehension, rate in words per minute, number of fixations and regressions per 100 words, span of recognition, and duration of fixations.

71. Lee, R. B. "Value of Metronoscope Reading," *National Elementary Principal*, XVIII (February, 1939), 109-11.
Summarizes evidence concerning the value of the Metronoscope among elementary school pupils in improving comprehension, in reducing the number of regressions and fixations, in the number of books read, and in reducing the number of retentions in the first-grade.

72. Levi, Isabelle J. "Are High School Students Becoming More News-Conscious?" *Educational Forum*, III (March, 1939), 329-33.
Presents findings regarding the newspaper reading habits, particularly the current topics read, of almost 1400 students in grades 7 to 12, and of their families.

73. Lichtenstein, Arthur. "An Investigation of Reading Retardation," *Pedagogical Seminary and Journal of Genetic Psychology*, LII (June, 1938), 407-23.
Describes efforts to determine the specific causes of reading difficulty for twenty retarded readers whose "disability seemed most likely to be related to physiological or psychological causes."

74. *Life's Continuing Study of Magazine Audiences:* Report No. 1, December 1,

1938, pp. 23; Report No. 2, May 1, 1939, pp. 32. New York: *Life* (Time and Life Building, Rockefeller Center).

Report No. 1 describes the techniques used in determining average number of people reached by *Colliers, Liberty, Life, Satevepost,* and number "who read or look into a typical issue within four weeks after its issuance."

Report No. 2 supplements this by summarizing the results of 5,015 new interviews both separately and in combination with the results of 8,030 interviews referred to in Report No. 1.

75. Looby, Ruth. "Understandings Children Derive from Their Reading," *Elementary English Review,* XVI (February, 1939), 58-62.
Reports data regarding the ability of 77 sixth-grade children to understand words and phrases read in literature, and the influence of such factors as mental ability, reading comprehension, and use of context.

76. Mahakian, Charles. "Measuring Intelligence and Reading Capacity of Spanish-Speaking Children," *Elementary School Journal,* XXXIX (June, 1939), 760-68.
Presents data on 313 Spanish and English speaking children in grades 1 to 7; compares relative reading achievement on tests given both in Spanish and in English.

77. Martin, Cora M., and Rochefort, Golda Mullins. "Adapting Reading Instruction to Different Ability Levels," *Newer Practices in Reading in the Elementary School,* pp. 539-45. Seventeenth Yearbook of the Department of Elementary School Principals, Bulletin of the Department of Elementary School Principals. Vol. XVII, No. 7, Washington: Department of Elementary School Principals of the National Education Association, 1938.
Presents results of a program to improve reading instruction in the sixth and seventh-grades, classifying forty-two children into three groups in terms of reading test scores.

78. McGaughan, Geraldine E. "Remedial Reading at Textile," *High Points,* XX (December, 1938), 55-58.
Presents results of a remedial reading program involving 150 high school freshmen.

79. McNeil, Mellicent. "Readings in Freshman Composition," *English Journal,* (College Edition) XXVII (November, 1938), 766-70.
Presents data on the improvement in reading of two hundred and ninety teachers college freshmen enrolled in an English course stressing reading interests and skills.

80. Meighen, Mary, and Barth, Ethel. "Geographic Material in Third-Grade Readers," *Elementary English Review,* XV (December, 1938), 299-301.
Compares geographical concepts and references contained in third-grade readers published in 1925-30 with those published in 1930-37.

81. Moser, H. M. "A Qualitative Analysis of Eye-Movements during Stuttering," *Journal of Speech Disorders,* III (September, 1938), 131-39.
Analyzes the eye-movement records of fifty-two adult stutterers secured under four conditions: silent fixation, silent reading, oral reading, and fixation during "propositional speech."

82. Moss, Margery Anne. "The Effect of Speech Defects on Second Grade Reading

Achievement," *Quarterly Journal of Speech*, XXIV (December, 1938), 642-54.
Compares the scores in oral reading in nineteen public schools of pupils with speech defects and pupils of "comparable intelligence, chronological age and school achievement" who have normal speech.

83. Motter, George A. "Teacher Assignments Versus Workbook Assignments," *School Review*, XLVII (January, 1939), 44-50.
Compares the workbook method and the teacher-directed method of recitation and discussion in the social sciences, in the case of two groups of eighth-grade pupils of 70 members each.

84. Oak, Lura. "An Appraisal of the Betts Visual Sensation and Perception Tests as a Sorting Device for Use in Schools," *Journal of Educational Psychology*, XXX (April, 1939), 241-50.
Reports results of an investigation among 200 children aged 6 to 15 to determine whether the Betts Visual Sensation and Perception tests as "dispersed and used in schools serve to sort out the children who should be referred to an eye specialist."

85. O'Bannon, Mary B. "An Experiment with Homogeneous Grouping in Reading," *Newer Practices in Reading in the Elementary School*, pp. 333-38. Seventeenth Yearbook of the Department of Elementary School Principals. Bulletin of the Department of Elementary School Principals. Vol. XVII, No. 7, Washington: Department of Elementary School Principals of the National Education Association, 1938.
Presents data on results of grouping over three hundred pupils in grades III to VI into nine levels on the basis of reading ability.

86. Petty, Mary Clare. "An Experimental Study of Certain Factors Influencing Reading Readiness," *Journal of Educational Psychology*, XXX (March, 1939), 215-30.
Studies relation of five factors, including intelligence, eidetic imagery, skill with reading symbols, susceptibility to illusions, and ability revealed in drawings, to the reading success of 102 low first grade children.

87. Phipps, William Rodgers. "An Experimental Study in Developing History Reading Ability with Sixth Grade Pupils Through the Development of an Active History Vocabulary," *Journal of Experimental Education*, VII (September, 1938), 19-23.
Attempts to "determine the relation of growth in ability to use the language of history in written expression and the ability to read history material in which the expressions and patterns of language are found," using as subjects 186 sixth-grade pupils.

88. Pond, Frederick L. "Influence of the Study of Latin on Word Knowledge," *School Review*, XLVI (October, 1938), 611-18.
Compares English vocabulary scores of 30 pairs of high-school students matched for sex, C.A., I.Q., school achievement, and semesters of attendance, the experimental group having had from 1 to 5 semesters of Latin.

89. Read, Cecil B. "The Prediction of Scholastic Success in a Municipal University," *School and Society*, XLVIII (August 6, 1938), 187-88.
Presents correlations between academic grades at the Freshman college level

and various types of previous records and test scores, including reading comprehension and rate.

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Compares the number of books read by a control group and by a fourth-grade group which participated one day each week in a "conference group" on library reading.

91. Rothney, John W. M., and McCaul, Robert L. "Reading Preferences of High-school Boys," *English Journal*, XXVII (October, 1938), 650-60.
Analyzes choices of "306 eleventh-grade, college-preparatory boys" recorded on a reading inventory listing various types of books, magazines, newspaper selections, and particular topics or fields.

92. Scarlet, Will. "Report on Remedial Reading, New York City High Schools, February, 1937 to January, 1938." High School Remedial Project No. 465-97-3-103, Conducted by the Board of Education of the City of New York and the Works Progress Administration (New York: Board of Education, 1938), Pp. 61. (Mimeographed.)
Describes the results of a high school remedial reading project the aim of which was "to discover, evaluate, and develop remedial and corrective methods and techniques."

93. Seegers, J. Conrad (Chairman). *Vocabulary Problems in the Elementary School.* Prepared by a Committee of the National Conference on Research in English. Seventh Annual Research Bulletin of the National Conference on Research in English (Chicago: Scott, Foresman & Co., 1939), Pp. 60. See also: *Elementary English Review* XVI (April, May), 1939. Pp. 157-66; 199-204.
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94. Shanner, William M. "A Study of the Results of Reading Tests Administered a Year Apart," *1938 Fall Testing Program in Independent Schools and Supplementary Studies. Educational Records Bulletin*, No. 26 (New York: Educational Records Bureau, 1939), pp. 59-62.
Presents the correlation between the results of various reading tests given a year apart to several hundred pupils in Grades II-IX, inclusive; compares progress of pupils in independent and public schools.

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Reports the concepts represented by the vocabularies of seven pre-primers and six primers.

96. Sisson, E. Donald. "Eye-Movement Training as a Means of Improving Reading Ability," *Journal of Educational Research*, XXXII (September, 1938), 35-41.
Summarizes and interprets findings of a controlled experiment which aimed to compare "the results of training eye-movements themselves with training via mere motivated reading," in the case of 29 college students.

97. Sisson, E. Donald. "The Causes of Slow Reading: An Analysis," *Journal of Educational Psychology*, XXX (March, 1939), 206-14.
Surveys results of reading investigations to select the factors most strongly influencing level of reading ability, suggesting also techniques for remedying individual weaknesses in such factors.

98. Smith, Nila Banton. *Remedial Instruction in Reading with College Freshmen*. Bulletin of the School of Education, Indiana University, Vol. XV, No. (Bloomington, Indiana: Bureau of Cooperative Research, Indiana University, School of Education, 1938), Pp. 35.
Summarizes the results of a controlled experiment to determine the effectiveness of group and remedial reading among college freshmen for four hours weekly from October 18 to May 28.

99. Spache, George. "A Phonics Manual for Primary and Remedial Teachers," *Elementary English Review*, XVI (April and May, 1939), 147-50, 19 191-98.
Reviews and interprets the literature on phonics teaching, stressing its purposes, extent, results, arguments against it, where and how to teach it, and what phonic symbols to teach.

100. Stelzer, Theo. G. "Construction, Interpretation, and Use of Sight Reading Scale in Organ Music with an Analysis of Organ Playing into Fundamental Abilities," *Journal of Experimental Education*, VII (September, 1938), 35-4
Reports the procedures adopted in developing a sight reading scale in organ music, the criteria of likeability and of difficulty used, and the results of the applications of the scale to thirty persons.

101. Stone, Clarence R. "Most Important One Hundred Fifty Words for Beginning Reading," *Educational Method*, XVIII (January, 1939), 192-95.
Gives number of new words belonging to each of 8 difficulty levels categorically determined for the first three readers; ranks 150 words chosen as most usable for the earliest two stages.

102. Strickland, Ruth G. *A Study of the Possibilities of Graphs as a Means of Instruction in the First Four Grades of the Elementary School*. Teachers College Contributions to Education, No. 745 (New York: Bureau of Publications, Teachers College, Columbia University, 1938), Pp. viii + 172.
Presents the results of an exploratory study to determine "which forms of graphs" are intelligible to children of the first four grades and the minimum instruction needed.

103. Stright, Isaac L. "The Relation of Reading Comprehension and Efficient Methods of Study to Skill in Solving Algebraic Problems," *Mathematics Teacher*, XXXI (December, 1938), 368-72.
Reports an experiment involving seventy high school freshmen to determine relation of reading comprehension to algebraic skill, and effectiveness of specific training in reading and study on improvement in these two capacities.

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Reports data comparing eye-movements of one hundred and forty-two university students classified as "rapid" or "slow" readers.

105. Stromberg, Eleroy L. "The Relation of Lateral Muscle Balance to the Convergence and Divergence Movements of the Eyes during Reading," *Journal of General Psychology*, XIX (October, 1938), 437-39.
Analyzes eye-movement records of college students to determine whether there is "any association between the phoria reading and the amount of convergence movement of the eyes during interfixation movements."

106. Tate, Harry L. "Two Experiments in Reading-Vocabulary Building," *Modern Language Journal*, XXIII (December, 1938), 214-18.
Summarizes results of experiments to determine "what effect an understanding of root words has upon reading-vocabulary building" in Grade 8B and "the effect of listing words derived from the same roots without knowing what the root words are" in Grade 6B.

107. Tinker, Miles A. "Trends in Diagnostic and Remedial Reading as Shown by Recent Publications in This Field," *Journal of Educational Research*, XXXII (December, 1938), 293-303.
Summarizes the results of 54 outstanding recent reports dealing with diagnostic and remedial reading.

108. Tinker, Miles A. "The New 'Standards' for School Lighting," *School and Society*, XLIX (January 21, 1939), 95-96.
Challenges a recent code for practices in school lighting on the ground that experimentation cited as basis for standards is inconclusive or, as demonstrated for one study, is erroneous.

109. Tinker, Miles A. "Illumination Standards for Effective and Comfortable Vision," *Journal of Consulting Psychology*, III (January-February, 1939), 11-20.
Summarizes critically the results of illumination experiments relating to reading and other activities involving the use of the eyes.

110. Tinker, Miles A. "Speed *versus* Comprehension in Reading as Affected by Level of Difficulty," *Journal of Educational Psychology*, XXX (February, 1939), 81-94.
Reports experimentation involving over 600 university students to determine relationships between "rate of comprehension" and comprehension, measured on materials (1) identical or closely similar, (2) varying in difficulty.

111. Traxler, Arthur E. "The Relationship Between the Length and the Reliability of a Test of Rate of Reading," *Journal of Educational Research*, XXXII (September, 1938), 1-2.
Compares the number of lines read in two forms of a speed of reading test for various time intervals up to 500 seconds using 78 high-school juniors as subjects.

112. Traxler, Arthur E. "The Status of Research in Remedial Reading," *Special Supplement to the English Journal*, April, 1939. Pp. 3-20.
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113. Traxler, Arthur E., and Seder, Margaret A. "Summary and Selected Bibliography of Research Relating to the Diagnosis and Teaching of Reading, October, 1937 to September, 1938." Educational Records Supplementary

Bulletin C (New York: Educational Records Bureau, 1938), Pp. 21. (Mimeographed.)
Presents a summary and annotated bibliography of 65 items "relating to the diagnosis and teaching of reading."

114. Treacy, John P. "Recent Literature on the Textbook," *Catholic School Journal*, XXXIX (March, 1939), 71-73.
Summarizes the literature dealing with the textbook from 1936 to 1938 emphasizing findings that touch the "interests of teachers and administrators."

115. Turrentine, Louise G. "Recent Trends in the Field of Phonics," *Texas Outlook*, XXIII (January, 1939), 49-50.
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THE RELIABILITY AND VALIDITY OF THE EAMES EYE TEST[1]

THOMAS HARRISON EAMES
Boston University

Editor's note: **The author presents data from which he concludes that the Eames Eye Test is valid and reliable.**

VARIOUS investigators, including the author, have recognized the inadequacy of the commonly used school vision test as a means of screening out pupils needing professional eye care.[2,3,4,5,6] It has been estimated that only about 40 percent of the school children who require attention to the eyes are discovered by means of the ordinary school test of visual acuity now so widely used. The Eames Eye Test made its appearance in 1934 and was intended to offer a more efficient means by which teachers might detect eye handicaps among their pupils. The test was to have been used primarily by the students of the author and his colleagues and its present wide distribution was not anticipated. For this reason the battery was compiled by simplification and adaptation of ophthalmological tests of known value and was presented locally without statistical analysis of its reliability and validity.

The test consists of a battery of component tests, each of which is intended to detect certain gross classes of eye trouble. They are divided into two groups; Part I, with five tests, is intended to be used for screening out pupils with eye trouble, and Part II, with two tests, is designed to elicit information which may be of interest to school psychologists and remedial teachers. The tests in each part are as follows:

Part I.

Test 1. *Visual Acuity Test.*[7,8] This is the conventional Snellen Type visual acuity test which most teachers know as the School Vision Test. Its purpose is to detect eye conditions which impair vision rather markedly, such as myopia, amblyopia, etc.

[1] 1938 Edition.

[2] Betts, E. A. *Prevention and Correction of Reading Difficulties* (Evanston: Row, Peterson & Co., 1936), pp. 149.

[3] Durrell, D. D. *Durrell Analysis of Reading Difficulty* (Yonkers: World Book Co., 1937), Manual, pp. 20.

[4] Eames, T. H. "Improvement in School Eye Testing," *Education*, LVI (September, 1935), pp. 14-17.

[5] Peabody, R. W., and Hamilton, F. "Visual Efficiency in the Classroom," *Quarterly Journal of the R. I. Institute of Instruction.* XIII (July, 1939), pp. 6-13.

[6] Hitz, J. B. "Visual Testing Methods in Schools," *American Journal of Ophthalmology*, XXI (September, 1938), pp. 1024-1027.

Test 2. *Lens Test.*[9,10] This test is similar to Test 1 except that the child holds a lens over the eye with which he attempts to read the letters. The primary purpose of this test is to detect hypermetropia.

Test 3. *Astigmatic Chart Test.*[11,12,13] This is the conventional radiating line test for astigmatism. Although recognizing its numerous shortcomings, the author considered it the only even moderately good test simple enough for inclusion in the battery.

Test 4. *Coordination Test.*[14,15] A card depicting a chicken and a box is used with a common hand stereoscope such as is to be found in most schools as a part of the visual education equipment. The test is intended to detect serious conditions of heterophoria.

Test 5. *Fusion Test.* A card on which moons and stars appear is used in a simple hand stereoscope such as is mentioned in the description of Test 4. The intent of this test is to detect defects of binocular or two eyed vision.

End of Part I.

Part II.

Test 6. *Fusion of Type.*[16] This test is made by means of two cards used in an ordinary hand stereoscope such as is mentioned in the discussion of Tests 4 and 5.

Test 7. *Eye Dominance.* This is the common ring-sighting test.

End of Part II.

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[7] May, C. H. *Manual of the Diseases of the Eye* (New York: Wm. Wood & Co., 1930), pp. 11-14.

[8] Fuchs, H. F. *Textbook of Ophthalmology,* Translated by Duane. (Philadelphia: J. B. Lippincott Co., 1923), pp. 181-186.

[9] *Ibid.*, pp. 206, Sec. 213.

[10] May, C. H. *Manual of the Diseases of the Eye* (New York: Wm. Wood & Co., 1930), pp. 326.

[11] *Ibid.*, pp. 353.

[12] Fuchs, H. F. *Textbook of Ophthalmology,* Translated by Duane. (Philadelphia: J. B. Lippincott Co., 1923), pp. 208, Sec. 214.

[13] Schmidt-Rimpler, H. *Ophthalmology and Ophthalmoscopy* (New York: Wm. Wood & Co., 1889), pp. 87.

[14] Wells, D. W. *The Stereoscope in Ophthalmology.* Boston: E. F. Mahady Co., 1926.

[15] Fuchs, H. F. *Textbook of Ophthalmology.* Translated by Duane. (Philadelphia: J. B. Lippincott Co., 1923), pp. 298, Par. 6.

[16] Eames, T. H. "Low Fusion Convergence as a Factor in Reading Disability," *American Journal of Ophthalmology,* XVII (August, 1934), pp. 709-710.

The tests are non-specific because eye defects and diseases affect the eyes and their function so intimately and complexly that it is only in the most uncomplicated cases that simplified tests can be relied upon for diagnosis. Even in professional eye examination a large number of tests are made, each contributing its part toward the physician's understanding of the case. Eye trouble is often merely a sign of more serious underlying physical handicaps, the diagnosis of which requires medical skill. The teacher's purpose is best served by a test which will indicate the presence of eye trouble without regard to what it may be. Its nature and treatment may and should be left to the doctor whose training fits him for this specialized task. Like a true-false question the Eames Eye Test yields only one of two possible scores; eye trouble present or not enough eye trouble to affect the test results. These responses can be simplified by referring to them respectively as "present" or "absent."

The test was administered twice to one hundred individuals,[17] each of whom also underwent a complete eye examination, conducted by an oculist.[18]

Reliability was investigated by comparing the results of the test as given at two different times. The battery agreed with itself as to the presence or absence of eye trouble in 93 percent of the cases. Each of the component tests was studied in the same way and their reliabilities are presented in Table I. They measured consistently in 89 to 99 percent of the cases.

Validity was determined by comparing the test results with those of the oculist's examination in each case. The agreement between his examination and the test battery as regards the presence or absence of eye trouble sufficient to warrant correction or treatment was 97 percent. It was impossible to study all of the component tests in this way because of their non-specific character. Eye trouble is likely to result in disturbance of several of the ocular functions as well as the one most closely affected by the difficulty. This often results in trouble responses to more of the component tests than the one intended particularly for the given difficulty. This fact applies to all simple ocular tests and is not peculiar to the test under consideration. The Visual Acuity Test, the Lens Test, and the Astigmatic Chart Test tend to be more nearly specific than the

[17] Miss Elisabeth M. Lincoln, Elementary Supervisor and Mrs. Harrison V. Parker, R. N., of the Leominster, Massachusetts, Public Schools, and Mr. Roger C. Fenn, Headmaster, of the Fenn School, Concord, Massachusetts, coöperated in this part of the work.

[18] An oculist is a doctor of medicine who specializes on the eye.

others and these were studied in the same way as the test battery as a whole. The results are presented in Table II, which shows that their validity varied from 85 to 99 percent.

CONCLUSION

The Eames Eye Test appears to be reliable and valid.

TABLE I

RELIABILITY OF THE EAMES EYE TEST. AGREEMENT BETWEEN THE RESULTS OF A FIRST AND SECOND ADMINISTRATION OF THE TEST

a. The test battery as a unit	93%
b. The component tests.	
Part I.	
1. Visual Acuity Test	98%
2. Lens Test	99%
3. Astigmatic Chart Test	89%
4. Coördination Test	93%
5. Fusion Test	95%
Part II.	
6. Fusion of Type	
Card 1 (and)	94%
Card 2 (are)	95%
7. Eye Dominance	92%
Number of cases	100

TABLE II

VALIDITY OF THE EAMES EYE TEST. AGREEMENT BETWEEN RESULTS OF THE TEST AND OCULIST'S EXAMINATION AS TO PRESENCE OF EYE TROUBLE

a. The test battery as a unit	97%
b. Three of the more specific component tests	
1. Visual Acuity Test	99%
2. Lens Test	94%
3. Astigmatic Chart Test	85%
Number of cases	100

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Witty, Paul, and Kopel, D. *Reading and the Educative Process* (Boston: Ginn & Co., 1939), pp. 240-312.

THE TESTING OF BINOCULAR AND MONOCULAR ORAL READING SKILL

JANE FRAZER, JEAN OGDEN, AND F. P. ROBINSON
Ohio State University

Editor's note: The author presents data to show that the Keystone Tests of Binocular Skill do not give results consistent enough for diagnostic purposes at the college level.

THE Keystone Tests of Binocular Skill (Gray's Oral Reading Check Tests) seek to measure the relative efficiency of binocular and monocular oral reading. Reference [1] has been made to reading disability cases who could read more effectively under monocular than under binocular conditions, although no group testing statistics have been published. The purpose of this study is to report an evaluation of this test when used with college students.

METHOD

Forty-nine college students were initially tested with the three visual acuity slides (binocular, left eye, right eye) of the Betts Visual Sensation and Perception Tests to find which eye for each student had the better acuity. This eye was used for the student's monocular reading.

The regular Set IV ("for ability up to eighth grade and above—adult") of the Keystone Tests of Binocular Skill was supplemented by having the selection used for the right eye also printed for the left eye, and by having the selection for the left eye also printed for the right eye. This provided two selections for monocular reading by the "better" eye; two selections for binocular reading were already available. These selections were presented in the Telebinocular in serial order (Slide 1-binocular; Slide 2-monocular; Slide 4-binocular; Slide 3-monocular) in one sitting. The possibility of rotation of selections from monocular to binocular was not available but these selections are taken from the standardized Gray's Oral Reading Check Tests which it is claimed [2] "have been standardized in such a way that the vocabulary, number of words and the content of each slide are comparable with the other three slides in the *same* set. In other words, each set has four slides of equal difficulty." Questions provided with the selections were asked after each reading.

[1] Keystone View Company Manual of Instructions for Keystone Tests for Binocular Skill. Meadville, Penn; Davis, Louise Farwell, "Training Eyes to Read," *Parents Magazine*, Sept., 1938, p. 25; Davis, Louise Farwell, "Teaching of Reading to Visually Handicapped Children," *Peabody Journal of Education*, XVI (1938), 201-5.

[2] Manual of Instructions, p. 5.

Each selection was scored in the regular manner for errors in oral reading and for time of reading. The results are interpreted for any one individual by comparing binocular and monocular reading (time and error scores) to see which is the better. If monocular reading is superior, it is assumed that some factor causing this may be a retarding factor in reading performance under normal binocular conditions.

Eighty percent of the students used in this experiment were taken from a How-to-study course and represent a sampling of college students who are probably more prone than usual to difficulties in reading. First quartile, median and third quartile for intelligence (Ohio College Aptitude) are 32, 49 and 79 percentile on the norms of the test, for speed of reading (Pressey's Speed and Comprehension test) are 24, 44 and 73 percentile, and for comprehension are 30, 56, and 75 percentile. The testing of such a sampling of college students should indicate the value of this test for use at this school level.

The question approached in this study is how consistent and real is the diagnostic interpretation of this test when applied to college students?

RESULTS

The correlations between test scores on the various selections produced reliability coefficients for monocular testing of $.747 \pm .04$ for speed and $.510 \pm .07$ for errors, and reliability coefficients for binocular testing of $.765 \pm .04$ for speed and $.600 \pm .06$ for errors. It is interesting to note that the correlations between monocular and binocular reading were as high as these reliability coefficients, i.e., $.781 \pm .04$ for speed and $.651 \pm .056$ for errors. This raises the question whether monocular or binocular conditions are very important in affecting the reading of these selections by college students.

The most important measure, however, is the reliability of the difference between monocular and binocular reading. This measure is the basis for the diagnostic use of the test. Taking the difference between slides No. 1 and No. 2 as one measure and the difference between slides No. 4 and No. 3 as an immediate retest, we found the consistency of these differences to be represented by correlations of $-.302 \pm .09$ for time and $-.052 \pm .096$ for errors. For college students, then, these tests are not consistent enough in their discrimination to measure whether monocular or binocular reading is better in a given student. Whether this lack of discrimination at this level is due to (1) the homogeneity of college groups, (2) the lack of "top" on the test for college readers, (3) the unreliability of the test, or (4) the unimportance of this factor in

reading ability, is not entirely evident although probably several of these are contributing factors. The norms for Set IV for the eighth grade are given as 60 seconds for rate and 4 for errors. A glance at Table I indicates that the average college student in this group read slightly faster than this and made about the same number of errors. The measures of variability indicate quite a range of ability in the group studied. Since the conclusions of this study apply to testing at the college level (at the top for this test), some caution should be had in carrying the implication farther down in the reading scale.

TABLE I

OTHER DATA: A. MEANS AND STANDARD DEVIATIONS

	Monocular		Binocular	
	Slide 2	Slide 3	Slide 1	Slide 4
Mean Time	56.57	53.71	53.96	54.51
S. D. Time	7.96	7.36	8.43	8.21
Mean Errors	3.63	3.63	4.57	4.78
S. D. Errors	3.10	3.04	3.21	3.75

B. CRITICAL RATIOS FOR CORRELATED MEANS*

	Slide 1		Slide 2		Slide 3	
	Time	Errors	Time	Errors	Time	Errors
Slide 2	3.36	2.49				
Slide 3	0.33	2.52	3.66	0.00		
Slide 4	0.67	0.47	2.69	2.75	1.07	2.77

* Holzinger, K. J. *Statistical Methods for Students in Education* (New York: Ginn and Co., 1928), p. 243. Standard Error of the Difference between means when correlated.

It will be noted in Table I that the various selections tend to give comparable results, although No. 2 seems to be a little out of line in rate of reading. The "tendency" of the monocular slides to have fewer errors may be due to visual conditions, due to differences within the selections, or, of course, due to chance. However, the fluctuations in scores of individual tests tend to be quite pronounced. In measuring college students by the present practise of one selection for each type of reading, the standard error for time scores is about 4 seconds, and for error scores it is about 2.2 errors. In order to minimize the role of non-visual factors in producing differences in scores, it appears obvious that more than one selection should be used for each type of visual function.

CONCLUSIONS

1. The Keystone Tests for Binocular Skill (Set IV) do not give consistent enough results for diagnostic use at the college level. (Reliability of the difference between binocular and monocular reading: for time −.30, for errors −.05).

2. The use of a single selection for each visual condition, as in the regular routine of this test, allows so many non-visual factors to enter that it seems wise to use several selections for each test situation.

SUGGESTIONS ON THE STUDY OF MENTAL ENERGY

GEORGE A. BROWN, C. E.
Bloomington, Illinois

PSYCHOLOGISTS point out a clear distinction between (1) that direct physical reaction to sensations in response to which the central nervous system reacts at once and instinctively, under the control of the synergy of the physical organism; and (2) in contrast to this, that attentive, controlled response of social synergy which develops a growing consciousness through ideas as they take the form of a mental aid to ways of acting.

So distinct from the action of the synergy within the physical organism is this social synergy that psychologists assign its action to that part of the brain called the cerebrum. The cerebrum provides for a conscious direction of activities by the means of ideas. This is a distinctly new situation for the action of nature's energies.

The development of this form of energy is an evolution of mind activities in the cerebrum by which meaning is organized by contacts with situations favorable to the action of social synergy as a growing power to learn. The mind itself has no direct knowledge of the way the nervous center, with its connecting lines to all parts of the body, directs the detailed action of that muscular use required for a specific end. Training for any particular skill desired in physical action is a matter of trial and error, since the mind can only learn from the observed results the degree of skill attained. The consciousness compares results, and the nerve directed muscles try again and again to gain the needed skill. This means that the brain activity of the cerebrum is not in direct control of the way the muscles carry out an action.

How to analyze this evolving growth with its successive widening of resources and deepening of the ability in forming and carrying out ideas and ideals can be but tentatively considered at this time. Each step in the growth of mental development and in the related opportunities for attainment in learning calls for an adjustment to the new opportunities. It took eons of time for physical organs to evolve the five senses of the higher animals. It probably has required many thousands of years to evolve the sense of conscious ideas as a mind action in the cerebrum.

At present there are some reports from scientifically carried out studies of child activities beginning as young as two weeks. Dr. Arnold Gesell of the Institute of Human Relations at Yale University has carried his work over the first two years or more of infant life. Less com-

plete studies cover the years through kindergarten. For the common school ages, many facts of mental age growth and of attainment in learning are known. These facts now available give a bird's eye view of the conditions of growth in ability and attainment for which some analysis may be suggested.

On this basis, a first suggestion may be the recognition of the fundamental action of social synergy as the organizing nature-energy acting to form ideas in the cerebrum part of the brain. This action selects those sensations from the physical and social environment which do not call for immediate nervous reaction but do call out the interest and effort of social synergy. This action results in the forming of ideas which become a content of the conscious mind.

This first suggestion, therefore, includes the use of the special activity of the cerebrum part of the brain as it records ideas and gives a setting for them as part of that consciousness which establishes this special activity as that of mental life, and unites it with the further action of social synergy.

A second suggestion now follows with regard to the further action within the growing mind now taking form in a way to give consciousness an idea of a possible meaning of itself, if not as yet, a consciousness of its ideas as a part of what is common to other minds. This leads to:—

The third suggestion of the growth of a personality through the early efforts to imitate sounds in a way, perhaps, that is not easy to recognize, especially the sounds for commonly heard words. Much companionship contacts eventually give an intended meaning for the sounds, and a one-year-old feels himself somewhat of a person.

A fourth suggestion concerns the outcome of successive trial and error comparisons of ways to express ideas, partly by actions and gradually by understood words. When the child's own desire is expressed by words which mean the thought as he can express it, he becomes a companion.

A fifth suggestion combines several uncompleted efforts to be a companion in the sense of doing things together, and expressing individual ideas in words and actions. In doing this, a feeling of self-direction of ideas begins to develop which leads to some conscious efforts for repeating actions in a way to compare results and to gain some skill. The child of three or four begins this and by six is a real self-trainer for skill.

The result in mental development up to this point is ability to recognize language as the means for common understanding. The child is now ready to find in the printed story of activities and of social situations a

very definite picture of situations which are complete in themselves. He may or may not agree with the outcome, but the more definite union of ideas is recognized as a part of his own experience.

A sixth suggestion concerns the growth in the organization of mental ability from year to year as it widens and deepens its experiences with the gradually maturing contacts of new and changing situations. The long period of infancy and of youth provides time for the natural development of an ingenious mental power to recognize possible ways of organizing ideas.

This power develops in the ordinary experiences of puzzling situations in which, perhaps, too many or else too few ideas come to mind and either the best selection of ideas or the addition of the right idea has to be determined if the experience is to be understood. The mind meets experiences of this kind generally without being directly conscious of the mental power by which they are solved. It is experiences of this power, therefore, which indicate quite definitely the natural development of this ingenious ability of the mind for any individual, or for the growing mind at any particular chronological age.

It is these types of puzzling situations that have been arranged with increasing difficulty, and have been used for some forty years as intelligence tests. These tests have been so standardized as to give the score for each mental age. The ingenious power of mental action is tested by these ingenuity questions. They change their character somewhat when used for minds older than the age of fourteen.

A seventh suggestion:—in contrast with the naturally ingenious (that is, not specifically trained) mental activity—is that ever-widening use of mental power developed by the conscious direction of the processes for learning. For this use, study and training precede the consciousness of full ability, and are consciously directed toward the attainment of particular abilities as a means to a wider understanding of situations by which to enlarge or make more effective the connections of personality with particular aims in the activities of life with one's fellows. This development of mental power evidently involves the enriched development of the person by the exercise of a consciousness which includes not only the sense of a self-organization of ideas but also includes the larger sense of common knowledge, and of close union with other persons through a consciousness of the actual interplay of the common energy called social synergy, without which human life would be little more than a selfish striving on perhaps an even lower plane than savage animal life.

EDITORIAL

INSTRUMENTATION AND RESEARCH

In this number appears the annual review of research in reading, prepared by Dr. W. S. Gray of the University of Chicago. A cursory examination of the appended bibliography will make it clear to the reader that there is a great variety of investigations in this area, probably greater than in any other curriculum area. Undoubtedly the reason for this is the availability of more or less perfected instruments and apparatus needed for carrying on reading investigations. These vary from such devices as paper and pencil tests, laboratory devices used to measure vision, hearing, and other physiological characteristics of the reader, interest inventories, instruments like the ophthalmograph for photographing eye-movements, and similar widely used methods of attack, to the quite recently developed technic, called the "electro-encephalograph," used to record "brain potential" and its fluctuation under different sorts of reading conditions. As rapidly as these new devices have been perfected by workers concerned with problems in learning and diagnosis, ingenious applications of the precise objective procedures have been made by reading investigators in all parts of the country. The result has been that there is being compiled a vast amount of information about reading and the mental processes involved, the implications of which are profoundly affecting instructional procedures, the construction of materials of teaching, the diagnosis of difficulties in reading, and the organization of the curriculum. We are now faced with the problem of synthesizing these contributions in such a way that they may be intelligently and effectively integrated in educational programs generally.

It seems quite obvious that the application of the devices useful in the study of reading problems can easily be extended to other areas in which reading plays an important part. However, new instruments must be devised that may be more definitely suited to problems in particular areas of learning, such as arithmetic, language, and the social studies. In the first of these three areas there are available numerous devices useful

in investigation, such as diagnostic tests, readiness tests, and interview technics, but they are lacking to a large extent in both language and social studies. This may account for the fact that the amount of scientific research in problems in learning in language and social studies is not nearly as great as it is in the fields of arithmetic and reading, particularly the latter.

Many of these instruments that have been developed as laboratory technics are being adapted in various ways for more general use by teachers and field workers. The apparatus in some cases is very expensive. However, due to pressure by commercial interests many schools are purchasing this technical laboratory equipment without a clear understanding of its function and value. Its use by clinical workers is obviously desirable, but there can be little doubt that its unintelligent application by most teachers is a sheer waste of both time and money. The wisest procedure in this direction would seem to be the development of devices based on research technics that can be used by the teacher in sifting out cases that require more intensive study of the type that can be made by a well-equipped clinical laboratory. In smaller school systems where such clinical facilities are not available selected teachers can be given the training necessary for fairly complete diagnosis of learning difficulties. The inclusion of "practical" diagnostic tests in various textbooks, workbooks, and other kinds of instructional materials for use by the classroom teacher is a significant illustration of the attempts to make it possible for teachers to utilize more refined technics similar to those of the laboratory in guiding the learning activities of their pupils. These teaching devices are much less expensive than elaborate clinical apparatus and have been found to be very useful by many teachers. In a sense the utilization of these modified laboratory procedures makes each teacher a research worker, dealing with the scientific appraisal and treatment of difficulties in the field of learning.

LEO J. BRUECKNER

REVIEWS

Address all communications relative to book reviews to Editor Kai Jensen, University of Wisconsin, Madison, Wisconsin.

FREEMAN, FRANK N. *Mental Tests: Their History, Principles and Application.* (New York: Houghton Mifflin Company, 1939), pp. x+460. $2.50.

This book of sixteen chapters is a comprehensive treatment of the subject of mental tests, except that the discussion of application is limited to their use in education. It is particularly commendable for completeness of analysis of problems and methods involved in mental test construction, in interpretation of results and of their practical application in education. Its objective is to serve as a textbook for college and University classes studying mental testing, and, with the exception of the absence of well selected lists of references is well designed for this purpose. Attempt is made, and we believe reasonably successfully, to treat controversial subjects impartially by reviewing the evidence and opinions on both sides, while adding his own criticisms and conclusions.

The first two hundred and thirty-six pages are devoted to the description and discussion of the various types of tests, Binet scales, point scales, and personality tests. The next eighty-four pages are given to technique and theory, covering subject matter of tests, selection and organization of test items, and scores and norms. Then comes a chapter in tabulating results, followed by forty-eight pages on the use of test results in education. The two closing chapters are an interpretation of mental tests, and the nature of ability, which are mostly summaries of what was said before.

In the organization of the material he does not follow the three aspects of the subject given in the sub-title, nor even the chapter headings very closely. Discussions of theory and principles, particularly, run throughout the book, instead of being limited more or less to the chapters on technique and theory. However, this mode of treatment is probably more satisfactory than a complete separation of description of tests and discussion of theory would have been. The chief problem in the development of mental tests is that of the more precise definition of abilities to be measured, he thinks, and factor analysis must give the answer. Binet and other age scales giving a composite measure will continue to be used, but these will be so constructed that the score may be analyzed into measures of particular abilities. A fundamental difficulty with these scales is the laboriousness and finality of standardizations, not permitting the addition or substitution of other tests without re-standardizing the whole scale. In this and other respects the point scale, like the Army alpha and that of Yerkes have an advantage. Point scales are now the prevailing type, and the Terman-Merrill 1938 revision of the Binet tests will prove to be the last age scale.

Following this, a chapter on tests for the analysis of mental capacity discusses aptitude tests, tests of special abilities,

and profile tests, and a separate chapter on tests of personality traits brings the reader to the chapters on technique and theory. Attempts to clearly distinguish between these are not entirely successful. Factor analysis may ultimately enable us to abandon classification into tests of intelligence, aptitudes, and special abilities. The purpose of profile tests is the separate measurement of various capacities, an idea more difficult in execution than in conception.

Differences in personality traits must account for the fact that intelligence and school achievement do not run parallel. As with tests of different abilities, we do not know what the different personality tests measure, and as with the former, factor analysis must give the answer.

Subject matter of tests is discussed in connection with tests of special capacity, tests of primary abilities, and tests of general intelligence. In constructing tests of a special capacity one may *a-priori* define the capacity, and *a-priori* select the tests that are supposed to measure it. Or he may empirically select tests until he finds some that work. In the earlier period of tests the former procedure was common. Now a combination of the two is usually followed. The selection of subject matter for tests of primary abilities is done by factor analysis. The statistical procedures for finding these factors are given as the two-factor analysis of Spearman, the bi-factor analysis of Holzinger, and the multi-factor analysis of Thurstone.

An analysis of the army tests shows that tests that correlate highly with a criterion also have a high intercorrelation, while tests showing a low correlation with a criterion have a low intercorrelation. It is psychologically impossible for tests to correlate highly with a criterion and have a low intercorrelation at the same time.

In the organization of items of tests the first consideration is right degree of difficulty. In the best arrangement the items increase in difficulty so that the median item will be passed by fifty per cent of the group tested. All are measures of both speed and power, some intellectual powers requiring measurement mostly of speed, while others require measurement mostly of power.

Different methods of weighting scores on separate tests for combination into a total score are considered. Weighting so that all will contribute equally to the total score is regarded as important only if the tests measure relatively distinct capacities, and too little is known of this to warrant the attempt. Unequal weight may be given on the basis of unequal importance, the latter being determined by difficulty of the test or correlation with criterion. This involves cumbersome procedures and apparently does not give a better total score.

In discussing next the measures of relative standing the question about the constancy of the I.Q. gets most of the attention. The conclusion is somewhat wavering. He notes that two facts are involved, the form of the age progress curve, and the relative distribution of scores at succeeding ages. By scores he means mental ages, and undoubtedly the use of a true unit of measurement in determining the age progress curve is to be assumed. Then he shows by graphs that if either the age progress curve is a straight line or if the distribution of mental ages at successive ages remains constant and the growth curve is logarithmic the I.Q. remains constant. Incidentally he states that the scores obtained with a mental age scale do not permit the derivation of the normal mental growth curve. But Thurstone has done it, and the reviewer has pointed out elsewhere how it could be done from the course of I.Q. changes that go with a

given high or low percentile score in the norms of an age scale. In the end Freeman expresses a preference for scoring based on standard deviation, but does not discuss the so far unsurmounted difficulties met in standardization.

The eduactional use of tests depends in part on the possibility of predicting future intelligence from present test results. Grade grouping of children on the basis of mental age has the disadvantages of late entrance of the dull, who need more rather than less schooling, of bringing together children of various physical and social development, and of requiring constant re-adjustments because of the different rates of development. Adjustment of nature of curriculum to differences in abilities is preferable to adjustment of rate of progress through the grades.

Doubtless no reader will agree with all of the author's conclusions on the many controversial matters discussed, and some will feel that the evidence has not been fully or equally well presented on both sides. This reviewer would take special exception to the view that the chief problem in mental tests is the definition of the abilities being measured. There are others who have forgotten the chief lesson that Binet taught, as is evidenced by the popularity of profile scoring and the volume of work on factor analysis. We believe that the practical value of the Binet and similar scales has been solely in the relatively high correlation between the objective scores they yielded and other objective facts of practical value, such as school achievement, abilities in various occupations, and living up to various social requirements, and not in the least in a knowledge of what the scale measured. Knowing what particular ability each test in a Binet scale measured would not add one bit to its practical value, unless we knew also the correlation between each particular score and some particular activity of life in which there is some interest. We would also sharply disagree with the author's conclusions on the advantages and disadvantages of year scales and point scales, and that the former is on the way out. His discussion of the I.Q. especially with reference to its constancy is disappointing, both from the standpoint of presentation of the facts found empirically and from the standpoint of deductive reasoning. There are other things in the book with which this reviewer disagrees, but to enumerate them would only emphasize the fact that there are many debatable questions in the field of mental tests, which is one of the things Freeman brings out well enough. As a textbook for students of mental tests, we believe it has at present no superior. Selected lists of references for supplementary reading should, however, be added, and "in Education" should be added to the sub-title.

F. KUHLMAN.

Bureau of Mental Examinations
State of Minnesota

HAMILTON, JAMES ALEXANDER. *Toward Proficient Reading* (Claremont, Calif.: Saunders Press, 1939), pp. ix+152. $2.00.

All those who are familiar with the fundamental research in the field of reading will disagree with the adequacy of a statement taken from the "Foreword" and used in part on the jacket and on the advertising folder to characterize this book. It states that the book "collects together . . . all the essential facts concerning adult reading difficulties and how to remedy them." In general the text presents an approach to remedial reading which is deleterious to sound progress in the field. All too frequently there are writers who promote the narrow view that reading is mainly a mechanical process consisting of word recognition. They

place heavy emphasis upon techniques and devices to promote rhythmical eye movements during reading, to increase the span of recognition, to improve the accuracy of the sweep of the eyes from one line to the next, etc. Unfortunately, all this tends to divert attention from assimulation and the thinking side of reading. How absurd this approach may become is indicated by the experimentally demonstrated fact that reading without any comprehension at all may produce perfect eye-movement rhythm with few fixations per line. The efficient or mature reader is not one who moves "the eyes rhythmically across the page" for line after line but rather he is the person who shows versatility and adaptability in adjusting to various types of reading situations. Thus the eye-movement patterns of the efficient reader will vary according to the demands of the textual materials upon the perceptual and assimulative processes.

After briefly considering the problem of silent reading, the author discusses vocalization in reading, structure of the eye, eye movements, comprehension and speed, vocabulary, productive reading, hygiene of vision, and illustrative case histories. The discussion of ocular anatomy is irrelevant in a text of this kind. Although some increase in proficiency may be expected from the use of the techniques outlined by the author to improve the mechanics of reading, it has been demonstrated that just as much progress may be obtained without the use of *machines* and without a "ritual" specified to establish rhythm reading.

Some of the specific items which might be criticized are: (1) On the average one can expect 20 to 25 percent increase in reading speed rather than 50 to 100 percent as stated by the author. Overstatements of this sort can only lead to disappointment for the reader who is trying to improve himself. (2) To advise that interpretations be based upon the photographic record for reading a single line seems absurd, especially after the author had already admitted that the record for seven lines constitutes too meager a sample of reading. (3) Contrary to the author's statement, counting of eye movements from direct observation is far from accurate. (4) The discussion of hygienic illumination intensities and of optimal typography reveals inadequate acquaintance with the literature on the subject.

To the uninformed this book may have a definite appeal. The discussion of machines to be used for diagnostic and remedial work plus the "ritual" suggested for establishing eye-movement rhythm sound authoritative and might seem to be fundamental. If there is to be sound progress in the field of remedial reading, however, a much broader program of diagnosis and training than that outlined in this text must be employed.

MILES A. TINKER.

University of Minnesota

McCALL, WILLIAM A. *Measurement.* (New York: Macmillan Company, 1939), pp. xv+535.

This volume represents an attempt at a broad fundamental treatment of the field of measurement. From many viewpoints, the author has been relatively successful in this attempt. This book contains much that is of high value from both theoretical and practical points of view, but unfortunately the method of organization and presentation is such as to make much of the content relatively difficult to locate and use. Among the causes of this difficulty are the mixture of elementary and more advanced material and the fact that the index is not complete enough or well enough organized to make it easy to find all that the volume contains.

The first chapter presents seventeen of these which constitute McCall's philosophy of measurement. Eleven of these are the same as the corresponding number of those in the list of fourteen which he presented a number of years ago. The first of the new set, "The ultimate test of all things is the happiness they yield," does not seem very directly connected with most of the others and the fifth "Tests perform a vital service to governments," does not appear to coördinate with the others but in general these theses present a fairly fundamental and satisfactory basis for measurement. Other especially good features are the discussion of test validity, the section dealing with test instructions, the consideration of ability grouping, and the general style of writing, which is unusually interesting and in numerous instances seems to be evidence of dynamic thinking. The extensive list of tests is good but for many readers a shorter critically selected list might be more helpful. The procedures outlined appear in some cases to be too mechanical and in others the program contains so many features as probably to bewilder teachers who have had little or no training or experience in the use of tests. Too much emphasis is given the author's own instruments of measurement and also the grade score. The discussion of intelligence might well be strengthened.

There are several statements in the book to which the reviewer objects as being either definitely erroneous or liable to lead to incorrect conclusions. Among these is the limitation upon what McCall refers to as "a straight knowledge test," at the bottom of page 30; the limitation on discarding test items in forms which are usually undesirable, found on page 36; reference to the Ayres Spelling Scale as a test: the statement that test reliability applies to a situation in which the two or more applications must be by the same examiner; the distinction between reliability and objectivity; the details of the scoring system of the Clapp-Young Self-Marking Tests: the method of deriving the weight for a test, given on page 148; the determination of projected Gi's by addition of a constant amount rather than multiplication by the proper ratio; and the procedure in assigning rank orders when the number of tied cases is even, on pages 436-47.

In a number of cases, points, usually minor, that seemed necessary to well-rounded treatments of the topics being dealt with, are omitted. In several cases these are explanations or reasons for suggested procedures or points of view. Also the discussion on constructing informal tests is too brief in comparison with the importance of the topic. The suggestions for scoring given on pages 70-71 do not consider the marking of papers so as to assist pupils in correcting their errors when they are returned and to yield possible diagnostic values.

There are also several general points of view with which the reviewer disagrees. He believes that McCall is too unfavorable toward matching tests; that instead of encouraging guessing on alternative and perhaps other tests, the effort should be made to put a premium upon certainty of knowledge; and that the recommended marking system is subject to serious limitations because it is of little assistance in revealing inefficient teachers.

C. W. ODELL.

University of Illinois

GRIFFITH, COLEMAN R. *Psychology Applied to Teaching and Learning: A First Book in the Field of Educational Psychology* (New York: Farrar and Rinehart, Inc., 1939), pp. xii + 650. $2.60.

This book is based on the thesis that no teaching is effective without a knowl-

edge of human nature. Since human nature is the primary subject matter of psychology, this discipline becomes important for students of education. The early chapters present and emphasize the importance of genetic psychology for such students. This is followed by a section devoted to a presentation and application of specific psychological concepts to concrete class-room situations. The last section is concerned with an examination of education from the standpoint of mental hygiene.

The most interesting and commendable feature of the book is the emphasis laid upon the application of psychological principles to teaching problems. The author presumes an acquaintance with elementary psychology and devotes himself largely to putting principles to work.

Dr. Griffith's clarity of exposition is seriously marred by his chapter organization which is characterized by too many sections, headings, sub-headings, etc., each minor part of which is summarized. The device of appending a summary to every three or four pages of text destroys the continuity of the chapter and makes the book unduly long. The review questions and exercises at the end of each chapter are excellent and constitute a chapter summary in themselves.

D. C. WILLIAMS

University of Toronto

DUNLAP, JACK W. *Workbook in Statistical Method: With Special Reference to the Social Sciences* (New York: Prentice-Hall, Inc., 1939), pp. ix + 145. $1.75.

This workbook is designed for "an integrated course giving some computation, some assumptions and derivations and considerable opportunity for interpretation of results." It contains exercises in the conventional topics of elementary statistics, such as tabular and graphic methods, central tendency, variability, the normal curve, sampling errors, and correlation. More advanced topics, such as partial and multiple correlation, chi square, validity, reliability, and measures of relationship, such as eta and biserial correlation, are included as well as various competational charts, tables, and nomograms. Short true-false tests are inserted at intervals.

An especially valuable feature of the book is the fact that in many of the exercises the student is given data from articles in the fields of education and psychology, asked to state the conclusions which can be drawn from the data, and to compare his conclusions with those in the original article. In some cases the data and the conclusions are quoted; the student is then asked to point out the error which was made if any. The mistakes illustrated in this manner include such items as neglecting a large positive correlational term, or neglecting to divide by N when calculating the standard error of a difference.

HAROLD GULLIKSEN

University of Chicago

RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

CARR, WILLIAM G., AND OTHERS. *City Teachers: Their Preparation, Salaries, and Experience,* National Education Association Research Bulletin, XVIII, No. 1 (Washington, D. C.: Research Division, National Education Association, January, 1940), 47 pp.

This bulletin contains a report on the preparation, experience, and salaries of over two hundred thousand teachers serving in cities above 2500 in population.

COLLIER, NINA P., DIRECTOR. *Preliminary Survey of Inter-American Cultural Activities in the United States* (New York: National Committee of the United States of America on International Intellectual Coöperation, September 25, 1939), 159 pp. Mimeographed.

This bulletin contains a description of organizations interested in Latin American affairs together with information concerning their activities.

Department of Public Instruction. *Public Education, Pennsylvania* VII, No. 6 (Harrisburg: Commonwealth of Pennsylvania Department of Public Instruction, February, 1940), 32 pp.

This issue of the Pennsylvania Department of Public Instruction monthly bulletin contains articles on Pennsylvania schools including administration and finance, instruction, teacher education and certification, professional licensing, state library and museum, school employes' retirement board, and Pennsylvania in history.

Department of State. *Conference on Inter-American Relations in the Field of Education,* Report of the General Findings Committee and Reports and Recommendations of the Six Group Meetings on November Tenth (Washington, D. C.: Division of Cultural Relations, Department of State, November, 1939), 24 pp. Mimeographed.

This bulletin contains reports on the Conference on Inter-American Relations in the Field of Education held in the Mayflower Hotel, Washington, D. C., November 9-10, 1939.

Department of State. *Principal Addresses at Conference on Inter-American Relations in the Field of Education* (Washington, D. C.: Division of Cultural Relations, Department of State, November, 1939), 22 pp. Mimeographed.

This bulletin contains addresses by Secretary of State, Cordell Hull, Under Secretary of State, Sumner Welles, Dr. Herbert Bolton, and Mr. Ernesto Galarza.

DODDS, B. L. *That All May Learn.* Bulletin of the National Association of Secondary-School Principals, XXIII, No. 85 (Chicago: National Association of Secondary-School Principals, National Education Association, November, 1939), 235 pp.

The author presents a summary and interpretation of the best thought, research, and practice dealing with the adjustment of the secondary school curriculum to the needs and abilities of the pupil.

FLANAGAN, JOHN C. *Scaled Scores* (New York: Coöperative Test Service, American Council on Education, December, 1939), 41 pp.

The author describes the system of scores used by the Coöperative Test Service and discusses the principles underlying their selection, their uses, and their limitations.

MCCONNELL, T. R., CHAIRMAN. *Report of the Committee on Educational Research for the Biennium 1936-38*, Bulletin of the University of Minnesota, Studies in Higher Education, XLII, No. 53 (Minneapolis: University of Minnesota, November 4, 1939), 42 pp.

This bulletin contains summaries of collegiate educational investigations at the University of Minnesota for the two year period, 1936-38, including administrative problems, Board of Admissions projects, examination studies, personnel studies, curriculum and instructional problems, and investigation of graduate schools.

MCCRACKEN, CHARLES C., AND OTHERS. *A Survey of Student Personnel Services in Fifty Colleges Affiliated with the Board of Christian Education of the Presbyterian Church in the United States of America*, Part II, Personnel Work with Students in College, Part III, Relative Importance of Student Personnel Services (Philadelphia: Charles C. McCracken, 822 Witherspoon Building, 1939), 74 pp. Mimeographed.

From a study of colleges affiliated with the Presbyterian Church, the author discusses personnel services including: recording information about the student, counseling services, student activities, financial aids, health and housing problems, placement service, and relative importance of student personnel services. Bibliography.

MCGEHEE, WILLIAM. *A Study of Retarded Children in the Elementary School*, Contribution to Education No. 246 (Nashville: George Peabody College for Teachers, 1939), 128 pp.

The author presents the results of a study of retarded children showing their mental status and scholastic achievement, personality, interests and social adjustment, and environment.

PARKER, J. CECIL, DIRECTOR. *Changing Secondary Education in the United States*, Secondary School Curriculum Study, Bulletin No. 2 (Lansing, Michigan: State Board of Education, October, 1939), 72 pp.

This bulletin contains a report of the Michigan Study of the Secondary School Curriculum including descriptions of recent and current studies of secondary education, and some modifications of secondary education in the United States.

SIMMONS, ERNEST P., AND BIXLER, HAROLD HENCH. *The New Standard High School Spelling Scale* (Atlanta: Turner E. Smith and Company, 1940), 64 pp.

This scale includes directions and suggestions for its use, and sixty-four lessons in spelling for junior and senior high schools.

Research Division. *Adult Education* (Washington, D. C.: Research Division, National Education Association, December, 1939), 23 pp. Mimeographed.

This bulletin contains a list of national agencies in the field of adult education and the second revision of a bibliography

prepared for the National Commission on the Enrichment of Adult Life.

Research Division. *Checklist of Materials Mailed to Subscribers to the Educational Research Service: January 1, 1939—December 31, 1939* (Washington, D. C.: Research Division, National Education Association, January, 1940), 7 pp. Mimeographed.

This bulletin is a list of publications mailed to subscribers by the Research Division during 1939.

Research Division. *Ethics in the Teaching Profession* (Washington, D. C.: Research Division, National Education Association, December, 1939), 24 pp. Mimeographed.

This bulletin contains a discussion of codes of state and national educational associations including the present status of codes, summary of standards, examples of codes, and references.

Research Division. *Tenure Legislation: 1939* (Washington, D. C.: Research Division, National Education Association, December, 1939), 20 pp. Mimeographed.

The Research Division presents a brief summary of state tenure legislation enacted during 1939.

STACK, HERBERT J., DIRECTOR. *Research in Safety Education at the Center for Safety Education, New York University* (New York: Division of General Education, New York University, January, 1940), 9 pp. Mimeographed.

The author classifies and lists the research studies in safety education being conducted under the supervision of the Center for Safety Education.

CURRICULA AND OBJECTIVES

SYMONDS, PERCIVAL M. "Economic Problems and Interests of Adolescents," *The School Review*, XLVIII, No. [illegible] (February, 1940), pp. 97-107.

From the results of a questionnaire study of economic interests of adolescents the author concludes that boys and girls of high school age are more concerned about earning money than about borrowing, spending, lending, or saving.

PSYCHOLOGY OF LEARNING AND TEACHING

BABITZ, MILTON, AND KEYS, NOEL. "An Experiment in Teaching Pupils to Apply Scientific Principles," *Science Education*, XXIII, No. 7 (December, 1939), pp. 367-370.

The authors present the results of an experimental study in which certain teaching techniques and testing devices were used in an attempt to improve ability in applying scientific principles in high school chemistry classes, and conclude that such ability may be improved with suitable teaching procedures.

GILBERT, LUTHER C. "A Genetic Study of Growth in Perceptual Habits in Spelling," *The Elementary School Journal*, XL, No. 5 (January, 1940), pp. 346-357.

The author presents data from a three-year study of pupils in grades four, five, and six supporting the trend of the findings of previous investigations of growth in perceptual habits in spelling.

JONES, WILLIAM J. "Measuring Some Outcomes of a Field-Study Experience," *Educational Research Bulletin*, College of Education, Ohio State University, XIX, No. 2 (January 17, 1940), pp. 31-47.

The author presents the results of a study of the outcomes of a trip by high school students from a relatively simple community to a complex community from which he concludes that desirable behavior changes take place when the field trips are carefully planned.

McKINNON, NETTIE J., AND BURTON, WILLIAM H. "An Evaluation of Certain Study Procedures in History," *The Elementary School Journal*, XL, No. 5 (January, 1940), pp. 371-379.

The authors present the results of an experimental study of the effects of definite, detailed instruction in certain study processes in history from which they conclude that such instruction definitely improves pupil ability to use those techniques.

TIFFIN, JOSEPH, AND MCKINNIS, MARY. "Phonetic Ability: Its Measurement and Relation to Reading Ability," *School and Society*, LI, No. 1311 (February 10, 1940), pp. 190-192.

The authors present the results of a study of the relationship between phonetic ability and reading ability from which they conclude that a program of reading instruction should include mastery of the principles of phonetics.

PUPIL GUIDANCE, WELFARE AND DEVELOPMENT

CARTER, GERALD C., AND SHANNON, J. R. "Adjustment and Personality Traits of Athletes and Non-Athletes," *The School Review*, XLVIII, No. 2 (February, 1940), pp. 127-130.

The authors present the results of a study of the adjustment and personality traits of athletes and non-athletes from which they conclude that athletes are slightly superior in adjustment and significantly superior in personality traits.

FAUQUIER, WILLIAM. "The Measurement of Attitudes of Delinquent and Normal Boys by Use of an Associational Technique," *Child Development*, X, No. 4 (December, 1939), pp. 231-239.

The author presents the results of a study of the attitudes of delinquent and normal boys from which he concludes that there are basic differences between the attitudes of the two groups.

STATISTICS, MEASUREMENTS AND SCIENTIFIC TECHNIQUES

DAVIS, WARREN M. "A Science Test Designed to Teach and Measure Outcomes Other Than Memorization of Factual Information," *Science Education*, XXIII, No. 7 (December, 1939), pp. 371-372.

The author presents a test designed for use with eighth and ninth grade science classes in teaching and measuring ability to detect superstitions and scientific inaccuracies.

GROSSNICKLE, FOSTER E. "How the Method of Scoring a Test in Division Affects the Score," *The Elementary School Journal*, XL, No. 5 (January, 1940), pp. 366-367.

The author presents the results of an experimental study of two methods of scoring a test in division, namely, the "correct estimation and remainder score," and the "correct example score" methods, from which he concludes that the former is more satisfactory for instructional purposes and that division can be taught in Grade IV with at least 80 percent retention for three-fourths of the group.

SMITH, ENID S. "A Procedure for Appraising Clubs," *The School Review*, XLVIII, No. 2 (February, 1940), pp. 108-118.

From the results of a study in which an attempt was made to develop an objective means of evaluating extra-curricular activities, the author concludes that "live" clubs have different characteristics than "dead" clubs but that further investigations are needed.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

Yearbook on Nature and Nurture.—Inasmuch as the 1940 Yearbook of the National Society for the Study of Education includes fifty contributions from as many workers, it is clear that no brief summary can do justice to the work. Perhaps a simple outline of the chapters in each of the two volumes, followed by a few of the outstanding discoveries and conclusions, will best serve the present purposes.

Part I, which is a separate volume of the Yearbook, is devoted to a comparative and critical exposition of the nature and nurture of intelligence. The Yearbook opens with an attempt to define in dynamic fashion certain crucial concepts, such as the meaning of intelligence, the meaning of environment, and the special problems of the dull and the bright. Of course these topics have been the occasion for frequent survey and exposition, but the sections have certain merits in the freshness and clearness of their presentation.

These chapters are followed by an extensive treatment of the physiological correlates of intelligence, a chapter rarely before available in the literature and now presented as something of a bridge between organic factors and the particular meanings and functions of intelligent behavior. Similarly, the rest of Part I is given over to critical accounts of various problems and issues with respect to the growth of intelligence. Surveys and critiques are presented on such topics as the following: relation of intelligence to socio-economic factors, sex differences in intelligence, a discussion of the researches on twins, intelligence and race, and personality and adjustment as determiners and correlates of intelligence.

The final section is given over to a rather extended survey of environmental influences upon intelligence and the present status of nature-nurture research. There is no attempt on the part of the committee to arrive at a unified statement to which all might subscribe. The volume closes with individual evaluations of the contents of the Yearbook by the various Committee members. In some instances these evaluations were extended to include general comments on the field as a whole. While these evaluations include a few detailed criticisms of methods or materials in the various Yearbook studies, they are, on the whole, more revealing of the point of view of a particular author.

In Part II are found twenty-seven studies, all prepared for this Yearbook. Some are original experiments or surveys, while others summarize, in briefer form, numerous recent publications on a particular topic. Thus there are ten reports on the effects of nursery school attendance upon the IQ, in seven of which gains are indicated, while no nursery school reports a loss. However, in some cases the gains were small, or not greater than similar children were able to make in selected homes.

In spite of the great interest in children's growth in intelligence, it is evident from the Yearbook that only two or

three research centers in the country have systematically investigated this problem on a long-time basis, with large samplings. The general conclusion which follows from these studies is that the child is more plastic along mental lines than many persons had hitherto expected; shifts in IQ that had been predicted only in relation to radical changes in environment are shown to be commonplace occurrences. Similarly, it is demonstrated that there is hope for some underprivileged children, but not for all, in mental improvement through environmental amelioration.

However, many of the studies are fragmentary and few of the major problems can be considered solved. It may be that such problems are in part insoluble, so long as dependence must be placed on rather gross testing materials and concepts. It is evident, too, that some of the major issues fall within scientific or social areas which are not without emotional concomitants.

The Yearbook was prepared by the following Committee, assisted by about fifty other contributors: Leonard Carmichael, Frank N. Freeman, Florence L. Goodenough, Leta S. Hollingworth, Harold E. Jones, L. M. Terman, Beth L. Wellman, and George D. Stoddard, Chairman, who prepared this summary statement.

Yearbook for College Teachers.—Arriving several months behind schedule, the 1939 Yearbook of the National Society of College Teachers of Education on "The Study of College Instruction" is an interesting treatment of the factors which condition college courses of study and methods of teaching, and an introduction to the technical resources available for attacking specific aspects of the problems of college instruction.

The authors, eighteen in number, with Harl R. Douglass, now of the University of Colorado, as chairman did not attempt to discuss methods of teaching at the college level. Apparently they chose instead to make available to the college teachers or other students of college instruction three types of material.

1. Recent and current changes that affect college instruction—changes in higher education itself, in secondary education, in the type of college student, and in the general social pattern of American life.
2. In condensed form, a statement of the most pertinent psychological considerations—principles of learning, personality, interest and motivation, individualization, and guidance and counseling.
3. Principles and examples of the most modern techniques of attacking various aspects and problems of college instruction — determining objectives, selecting and organizing instructional materials, evaluating outcomes of instruction, teacher rating, and appraisal of the extra-classroom service of the teacher.

A chapter on the professional education of the college teacher is also included, as well as two chapters which serve as introduction and recapitulation. The book is prefaced by an introduction which assesses the possible contribution of the educationist to the training of teachers and which stresses the importance of approaching all problems of instruction with a clear vision of carefully thought through objectives.

The authors of the various chapters are men eminently qualified to write on the subjects assigned to them. In addition to those who are college teachers of education, several were drafted from the field of psychology. Short, selected topical bibliographies are included and a selected general bibliography is appended.

To the college teacher, willing to read a few hundred pages, if thereby he may become conversant with all the worth while techniques of teaching, the volume will not be satisfying. To the thoughtful college teacher, who can understand that the most important equipment for the study of techniques in any field is a good "soaking" orientation in fundamental points of view and principles of approach, the symposium should prove very acceptable and very useful. It may be that it lacks somewhat in specificity and in vividness of detail in application, requiring some imagination on the part of the reader in applying what he reads to his own field of teaching. What it lacks in this direction is probably more than offset by the fact that practically all of the discussion may be applied to all fields of instruction—something that could not have been accomplished if the discussions had emphasized description of techniques of teaching.

While there is some variation in style among the chapters written by different authors, in general the discussions are non-technical or semi-technical.

This appraisal was prepared by Harl R. Douglass of the University of Colorado.

John Dewey Yearbook.—Outstanding among the contributions of the 1940 Yearbook of the John Dewey Society is the careful thinking through of what democracy will mean in terms of day-to-day activities of teacher-training institutions. Great emphasis is placed upon the need for potential teachers to learn about democracy in education through experience in the course of their preparation.

If the recommendations in the volume are followed, there will be a fundamental reorganization in all teacher-training institutions. Among other things, the integration of theory and practice will be placed upon a more solid psychological basis through the study of problems arising in connection with actual classroom experience. Students would not only study about education and learn how to conduct themselves as teachers in a classroom, but they would also devote study to their own education.

The striking proposals of the book represent a great departure from present practice, which limits its value for readers who are primarily interested in "next steps." As an analysis of present conditions, and as an indicator of possible future trends, the Yearbook is thought provoking, to say the least.

This appraisal was formulated by W. W. Wattenberg of Chicago Teachers College, a co-editor of the Yearbook.

Yearbook on Safety Education.—The purpose of the 1940 Yearbook Commission of the American Association of School Administrators has been to orient superintendents with regard to school programs in the field of safety. The Commission circulated thousands of questionnaires among classroom teachers and superintendents to ascertain current practices and possible future needs. The chapters of the Yearbook have been written in the light of these surveys. While the volume does not present a complete "course," it does outline the characteristics of a well-rounded program. Very few educators will be unable to find something in the report whereby existing school practices can be improved.

Criticisms will be of three general types. Safety organizations will say that "there is nothing new" in the book, which is an indirect way of patting themselves on the back for thinking of everything before educators. These groups will also regret that the Yearbook does not place its approval on some of the current panaceas. Some educators will be

disappointed because the report does not tell them exactly what to do and when to do it. The Commission avoided this role of infallibility because of the recognized need for the adaptation of safety programs to local needs and interests.

This statement was prepared by the Research Division, N.E.A.

Supervisors' Yearbook—Newer Instructional Practices of Promise is the title of the Twelfth Yearbook of the Department of Supervisors and Directors of Instruction, N.E.A. This Yearbook is intended as a practical guide to supervisors, administrators, and teachers in achieving growth and improvement in teaching. The reader will find discussions, illustrations, and suggestions pertaining to the newer classroom practices. An effort has been made to include only those practices that have been found to be practical and sound in the progressive school. Some of the discussions presented in this yearbook are: the importance and implications of the newer trends; wider utilization of environment; procedures for developing an integrative curriculum; newer practices involving industrial arts, dramatic play, and creative arts; newer practices in the teaching of reading and literature; the use of the library in the school program; the use of newer types of instructional media and materials; the adaptation of these practices to the needs of children. The chapters on the evaluation of newer instructional practices and the supervisory techniques adapted to these practices are especially significant to the supervisor and administrator.

This book describes the newer instructional practices of promise as experienced by many of our leaders in the field of supervision. Contributions have been made by William H. Burton, Ernest Melby, E. T. McSwain, Helen Heffernan, John A. Hockett, Natalie White, Corinne A. Seeds, Gladys L. Potter, Frederick W. Cozens, John F. Bovard, Martha B. Dean, Hazel J. Cubberley, Julia L. Hahn, Nora Beust, Blanche Kent, Peter L. Spencer, Lillian A. Lamoreaux, J. W. Wrightstone, and Maycie Southall.

This information was made available through the organization sponsoring the Yearbook.

Elementary-Principals' Yearbook.—The 1939 Yearbook of the Department of Elementary School Principals, entitled *Enriching the Curriculum for the Elementary-School Child*, contains information on a wide variety of actual practices in curriculum enrichment as reported by principals, teachers, curriculum specialists, and others. The practices described range from those used in carrying on a single unit of class work to those employed in a city-wide program of curriculum development. No attempt has been made, however, to outline either a model curriculum or an ideal administrative program for curriculum revision.

Aside from the variety and highly practical nature of its contents, probably the chief value of this yearbook lies in its broad interpretation of the curriculum. As conceived here, the curriculum is not confined to textbooks or formal courses of study, but includes all the experiences which children have under the supervision of the school. Viewed in this light, curriculum enrichment depends not only upon improved choices of subject matter, but also upon better methods of teaching and learning, wiser selection of school materials and equipment, wider and more effective use of community resources, more adequate methods of measurement and guidance, and more appropriate school organization and administration. All these factors are discussed and illustrated in the book.

To the critical reader certain limita-

tions of the volume will be apparent. First, being a collection of fifty-six separate contributions, it is not a comprehensive, closely integrated treatment of curriculum problems. Second, it does not review systematically the results of curriculum research. However, since these functions are adequately performed by other books in the field, their absence in this yearbook hardly detracts from its value for a majority of principals and teachers.

This information was provided by the Research Division of the N.E.A.

Mathematics Yearbook.—The Fourteenth Yearbook of the National Council of Teachers of Mathematics, entitled *The Training of Mathematics Teachers for Secondary Schools in England and Wales and in the United States*, is by Ivan S. Turner. The volume presents answers to the following questions:

1. How much mathematics is studied by secondary-school pupils in the two countries, and what standard is achieved?
2. Is the academic training of the mathematics teachers adequate to guarantee reasonably good teaching of school mathematics, with the standard of work required in the schools?
3. What is the nature of and how effective are the present methods of professional training of mathematics teachers in the two countries?
4. What facilities are provided for in-service training of mathematics teachers? How effective are these facilities?
5. What agencies other than the regular teacher-training institutions contribute to the training of mathematics teachers, and what are the nature and importance of their contribution?
6. What assumptions are implicit in the methods of training adopted in the two countries?
7. On what principles should the methods of training be based? In the light of these principles what are the strength and weaknesses of the training of mathematics teachers in England and Wales and in the United States?

Alabama Studies.—Eight projects have occupied the attention of the State Department.

Index of Taxpaying Ability to Support State Minimum School Program.—The Division of Administration and Finance of the State Department of Education, under the direction of R. L. Johns, recently developed a new index to measure the taxpaying ability of counties to support a minimum school program. The new index equates assessed valuation of property with the sum of six weighted measures of the economic wealth of each county as follows: Percent of sales tax paid, weight of 6; percent of auto licenses paid, weight of 5; percent of assessed valuation of public utilities, weight of 3; percent of state income tax paid, weight of 1; percent of farm income, weight of 1; and percent of value added by manufacture, weight of 1. The approach to the use of the six measures of economic wealth was adapted from the procedures proposed by Mort in *The Measurement of Educational Need* and by Cornell in *A Measure of Taxpaying Ability*.

The factor of assessed valuation of property is included in the index largely because the proceeds of five mills of local taxes on the assessed valuation of property, calculated as if levied and collected, are charged against counties as local effort in the State Minimum Program Law and are available for the support of schools. The new index was enacted into law by the 1939 Legislature and is not in operation. It is designed to prevent decrease in assessed valuation of property, regardless of property values, in order to secure additional state school funds.

School Surveys.—County and city school survey studies are conducted largely on pupil personnel, teacher personnel, school centers, school plant needs, pupil transportation, and school finance. The State Department of Education directs the school surveys in coöperation with the state institutions of higher learning.

School Bus Transportation.—Special studies are being made on safety and economy in school bus transportation. Findings to date clearly show that publicly owned bus equipment affords safer and more economical transportation than either privately owned or jointly owned school bus equipment. Uniform pupil transportation forms designed to give accurate and complete data have been developed and are in use. School bus specifications for safe and economical school bus construction have been developed and are in use. Procedures for allocating state aid to local school systems are being refined through the use of school survey findings and recommendations on school centers and pupil transportation.

Building Plans and Specifications for Non-permanent Centers.—In connection with the study of school centers and school plant needs, plans and specifications have been developed for the construction of frame buildings at low cost for school centers which cannot be definitely classified as permanent centers, due to the possibility of population shifts and possible future consolidation as road conditions improve.

Financing Capital Outlay and Debt Service.—Special studies have been made on the issuance and sale of school warrants of indebtedness for capital outlay expenditures and for refunding debts already outstanding at lower interest rates and with better schedules for paying principal and interest.

Research in Trade and Industrial Education.—Surveys were made by local coördinators of trade and industrial education in thirty-seven counties last year:

1. All enterprises (including manufacturing, distribution, and service) were canvassed in each community, and the original data gathered necessary to determine employment requirements and trends.
2. The data were classified, compiled, and interpreted in terms of training programs needed to meet the actual vocational opportunities of the community, both as to preparatory and extension training.

Research and Studies in Vocational Agriculture and Vocational Home Economics.—In vocational agriculture and home economics, informal studies are made by teachers each year on the farms and in the homes of pupils enrolled in day and evening classes for the purpose of securing factual information as a basis for courses of instruction and programs of work. These vary in each community, since the instruction given in agriculture and home economics is designed to aid in the solution of farm and home problems.

Through the school of instruction for agriculture teachers, formal studies are carried out, based upon problems which teachers have in their programs of instruction at their respective schools and designed to aid teachers in the solution of such problems.

Each year a number of experienced home economics teachers work toward an advanced degree. The problems selected are largely in terms of needs of the state program, even though the theses are directed by professors in some graduate institution of higher learning. Data are secured from teachers in the field and pertinent findings are incorporated in the state program.

Alabama Curriculum Development Pro-

gram.—The Alabama Curriculum Development Program was initiated in 1935, under the leadership of the Division of Instruction of the State Department of Education. The program proceeds under the guidance of a state steering committee representing all phases of public education. Consultative services have been supplied to administrative units by the state teacher-training institutions, and general consultants have been supplied by the Division of Surveys and Field Studies of George Peabody College for Teachers. As an important part of the guidance materials eight bulletins have been published, prepared by committees of teachers working in curriculum laboratories during summer terms. Groups of teachers are making studies of children and of community-life problems, such as health, recreation, income, housing, etc., as bases for determining in part the educational needs.

This information was forwarded by A. R. Meadows, Supervisor of Research and Surveys.

San Francisco Activities.—Among the accomplishments of the Bureau of Research of the San Francisco public schools during the past year, the following are noteworthy:

1. Extension of in-service training for administrators, counselors, and teachers.
2. Expansion of coördinating service to recognized social agencies.
3. Increase in facilities for pupil adjustment throughout the school department through the provision of better tools and techniques of evaluation.

The program of in-service training, which is continuous throughout the year, is a vital part of the program of measurement. Teachers and counselors are given specific training in the administration of tests and in the interpretation of measures of pupil growth through instructional bulletins, departmental meetings, group conferences, and individual conferences. Principals and teachers are encouraged in the development of programs to satisfy needs existing within their own school or class. The Bureau of Research gives guidance and assistance to those participating in such programs through conferences at the research office or at the teachers' workshop which operates on a weekly schedule. Upon the request of the principal, meetings are held at schools where projects are in progress.

The expansion of the coördinating service to include all locally recognized social agencies dealing with public school children has met with the approval of all concerned. Through this service agencies, clinics, and medical authorities associated with the clinics are provided with pertinent data relative to a child's school history. The information which the Bureau of Research is able to furnish often facilitates the determination of the subsequent treatment. This is a two-way service in which the schools also profit through the fact that they often gain information which their necessarily limited facilities for social case work do not provide.

The measure of success of all programs of research should be in terms of the service rendered to the pupils within the schools. Every activity in which the Bureau of Research participates has for its immediate or ultimate goal the improvement of facilities leading to maximum pupil growth. The growing awareness of pupil variability on the part of teachers has been of primary importance in meeting this objective, through aids provided for test interpretation. As teachers become aware of the differences existing among the individuals in their instructional groups, curricular modifications are made to meet them. Pupil "adjusto-

grams," which call attention to pupils in need of special educational consideration, are used extensively in the elementary schools. An analysis of pupils' test records, which is made after every measurement program, gives to the teacher specific information relative to individuals in need of adjustment, together with suggestions for remedial educational treatment. As teachers grow in their knowledge of pupil behavior and developmental expectancies, instructional problems as well as behavior problems diminish.

This information was forwarded by Lillie Lewin, Supervisor of the Bureau of Research.

Educational Research in Connecticut.—A division of research was created by the State Board of Education more than a year ago upon recommendation of Commissioner Alonzo G. Grace. Previously research had been part of the Office of Finance and Research, but, because of the financial situation, research had only a minor place in the program.

One of the first problems facing the newly created division was that of preparing basic data on teacher preparation for the use of a special commission appointed by Governor Baldwin to study the problem and report to him. This report was presented in April, 1939.

At present, the Division is directing its energy toward a study of vocational education in the state. One of the first projects has been an analysis of census data on occupations for the past three censuses to see what changes are taking place in the occupational pattern in Connecticut.

Another phase of the study has been a review of numerous follow-up studies to see what becomes of high school graduates and drop-outs. This is being supplemented by data from the State Employment Service on the placement of youth, the kinds of jobs they get, etc. Employment managers in the eighteen centers of the state have been canvassed as to the future work possibilities in their areas, and for an expression as to the kind of vocational training best adapted to the needs of their registrants.

The fields of vocational training receiving attention are the industrial arts and commercial courses, and the federally aided programs of vocational agriculture, vocational home economics, and trades and industries. For the last named, the state now has eleven trade schools, supported mostly by state and federal funds, and with an enrollment of nearly five thousand day students, about a thousand part-time extension students, and approximately five thousand evening students, and offering training in twenty-five different trades.

An extensive study of public school transportation is being carried on by the Division through one of the rural supervisors who has been given this assignment. He will study the practices and procedures of the towns in advertising for contracts, letting contracts, comparative costs, quality of the equipment, and similar problems.

The director of the Division is also acting as consultant in other studies, such as a study of boards of education to be carried on by the A.A.U.W., rural education by the League of Women Voters, and radio education and library service being carried on by members of the department of education.

The personnel of the Division consists of Joseph A. Baer, Director, and Robert H. Mathewson, Research Associate. The former prepared this news item.

Test Scoring Machine in Delaware.—With the financial aid of the State Board of Education, the University of Delaware, and 14 special school districts, a

test scoring machine has been rented from the International Business Machines Corporation. The machine has been placed in the office of the State Department of Public Instruction and will be under the supervision of the Department of Research.

In addition to providing test scoring services for all schools in the state, it is planned to establish a library of machine-scored tests in the Department from which schools may borrow sets of tests, paying only for the necessary answer sheets for the tests. This will cause a considerable saving in testing costs, since tests may be used repeatedly and answer sheets cost only one-fourth to one-half of what test booklets ordinarily do. There will be no charge to the districts for scoring test answer sheets and in the state-wide testing programs test booklets and answer sheets will be furnished free of cost, the districts being required only to administer the tests and send in the answer sheets for scoring.

A bibliography of machine-scored tests, with data as to grades in which they may be used, publishers, and cost of tests and answer sheets, has been prepared and distributed to the schools. This bibliography will be kept up-to-date through the Department of Research, in whose office a specimen set of each of these machine-scored tests will be available for examination.

During the fall of 1939 mental tests were administered to approximately 3,000 pupils in grades 5 and 6 throughout the state and reading tests to all pupils in grades 7 and 8 in the junior high schools outside of Wilmington. Machine-scored tests will be used in the secondary schools in the spring. An extended program of testing is being carried on this year in the schools of Wilmington. The administration and scoring of these are in charge of Z. R. Clark, Administrative Assistant in the schools.

The State Director of Research is R. L. Herbst, who forwarded this news item.

Florida Projects.—During the past year four studies occupied the attention of the Florida Department of Education.

School Code.—During 1938-39 the school authorities of Florida devoted much special study to the problem of school laws. Laws had been accumulating since the adoption of the Constitution in 1885 to the extent that it was almost impossible to determine for many fields which laws were in effect and which were not. Under a mandate from the Legislature the State Department of Education, working in coöperation with a special committee of the Legislature, made an exhaustive study of existing laws and in coöperation with various groups prepared a proposed new School Code. This proposal was approved by the legislative committee and the proposed Code with some modifications was approved by the 1939 Legislature and became law. Florida now has a comprehensive School Code which, together with other laws relating to education, is published under the title, *Florida School Laws, 1939.*

Dade County Survey.—The State Department with the assistance of other authorities in the field of education in the state undertook during 1938-39 a comprehensive study of the Dade County school system. This study, among other things, involves a detailed study of the 45,000 school children enrolled in the school system. Special attention is being directed to the achievement and progress of pupils who have been educated in the Dade County school system as compared with that of pupils who were visiting in the county during the year.

This study should have a special appeal because of the interest in Miami,

Miami Beach, Coral Gables, and other municipalities in the county as tourist centers. The report of all phases of the study, which includes the organization and administration of schools, the instructional program, the financial program, and other aspects, is expected to be completed by the end of the year 1939.

Teaching Personnel.—A comprehensive study of the teaching personnel of the state is now under way. This project involves the punching of three Hollerith cards for each teacher in order to assemble all information regarding training, certification, experience, and other pertinent information relating to each teacher. This investigation should be completed by the spring of 1940.

Curriculum.—In the curriculum field a series of studies was completed during the year 1938-39, and another series is now under way. Among the bulletins based on these studies are the following: No. 1, *Source Materials for the Improvement of Instruction;* No. 2, *Ways to Better Instruction in Florida Schools;* No. 3, *A Preliminary Guide to a Study of the Elementary Curriculum in Florida;* No. 4, *Plans for Florida's School Health Program;* No. 5, *Physical Education in Secondary Schools;* and No. 6, *Planning Curriculum Study with Local Groups.*

This information was provided by Edgar L. Morphet of the Department of Education.

Research in Georgia.—Research in the State Department of Education of Georgia may be divided into two general divisions:

1. Research of a statistical nature relating to status of organization and administration of the public schools in the state.

2. Research in the field of curriculum.

In the division of Organization and Administration of the Public Schools, the research department has the responsibility of tabulating and publishing, from the annual reports of superintendents of local units of administration, a large amount of statistical data. These data have to do with: information concerning the number of schools; the types of schools as to organization; the number of children; the number of teachers together with their training, experience, and teaching responsibilities; number of children of school age; number enrolled and average daily attendance; non-teaching personnel including superintendent, bus driver, janitor, nurse, and others employed in the public school program; value of building and equipment used in the teaching program; amounts of funds collected and expended; and certain other statistical information pertinent to the operation of public schools. During the past year this division has initiated a program for obtaining much information concerning children not in attendance at public schools. This department has compiled data concerning children who are under school age and also concerning those who are beyond this age and yet are under twenty-five years of age; information on employed and unemployed out-of-school youths has been compiled. This information was an attempt to determine what the out-of-school-youth of Georgia is doing. A special feature of these data is the tabulation of the actual names and addresses of all illiterates in the state.

In the Division of Curriculum Research the Department of Education carries on a continuous study of research problems in the curriculum area. This study is carried on through numerous committees composed of laymen and those actively engaged in teaching. It is not planned to have a course of study dealing with the curriculum, but to pub-

lish from time to time bulletins concerned with certain curriculum problems. These bulletins are the results of the work of a committee appointed for that purpose. The Director of Curriculum Research is M. E. Thompson, who forwarded this statement, and the Associate Director is Celia McCall, both of the State Department of Education, Atlanta. The University Advisor is Paul Morrow of the University of Georgia, Athens.

Kentucky Studies.—One of the major projects of the Bureau of School Service of the University of Kentucky during the past year was a study of the financial support of public elementary and secondary education in Kentucky. This study, made at the request of the Planning Board of the Kentucky Education Association, has been completed and the report published as a bulletin of the Bureau of School Service under the title, *Financing Public Elementary and Secondary Education in Kentucky*, Vol. XII, No. 1, September, 1939. The report describes extremes and variety in the geographical, social, economic, and educational situations in Kentucky. Comparisons are made over a period of years, showing decreases in support and increases in the types of services rendered. Estimates are made of the additional amounts of state support needed to provide certain expansions in the educational programs. The report will serve as the basis for promoting a legislative program to provide increased state support for elementary and secondary education in Kentucky.

During the present year the Bureau is engaged in the following research projects:

I. A study of the effect of education on nutrition practices in rural areas.—This study is being conducted coöperatively by the Institute for Consumer Education of Stephens College and the Bureau of School Service.

The objectives may be briefly described as follows:

1. To determine the present diet practices in selected rural communities designated as experimental and control areas.
2. To provide instructional materials on diet in the experimental communities.
3. To determine what improvement, if any, in diet practices results from the educational program within the experimental area.

Control and experimental areas are to be as nearly alike as possible with respect to community backgrounds, types of schools, qualifications of teachers, and other factors. In the experimental areas the schools will provide special instruction relating to diet. In the control areas the traditional school programs are to be continued. The experimental and control communities will be checked and compared as to improvement in knowledge and practices relating to diet. A major part of the experiment will be the development of techniques for measuring and evaluating social, economic, and educational conditions and the developing of instructional materials which will meet the needs and abilities of the pupils in these areas.

II. A survey of the city of Lexington and of Fayette County in Order to formulate a coöperative program of trades and industrial education at the secondary level.—

In this study analyses are being made of data relating to pupil interests and background, the present school situation, and the industrial situation in the city and county. This survey is being made at the

request of the boards of education of Lexington and Fayette County.

III. A survey of adult education in Kentucky.—

This study is attempting to present a picture of the many phases of adult education now being conducted in Kentucky and to make recommendations for a more permanent basis for such activities.

The Director of the Bureau of School Service is Maurice F. Seay, who forwarded this statement.

Portland Department of Research.—The department of research staff in the Portland, Oregon, school system consists of a part time director, H. M. Barr, who prepared this report, and two secretaries, supplemented by a research council made up of school principals especially interested in research techniques.

In former years the functions of the department were much more varied than they are today. In addition to the tasks of pupil accounting and the tabulation of statistics required by administrators in handling the problems of failure, retardation, classification and the like, the department was entrusted with the direction and supervision of classes in special education, the revision of curriculum, and the psychological examination of problem children.

To-day, following the growth and expansion of the school system, special departments have been created—one for special education and psychological examination, the other for curriculum revision. The functions retained by the department of research include the evaluation of skills and subject matter through various types of achievement tests, the usual statistical studies of failure and retardation, and the preparation of special reports concerning any phase of administration or instruction which might be required by any administrative officer or member of the school board.

During the last two years the department has been assigned the task of editing and publishing the *School Bulletin*, a bi-weekly issue designed to further contact between the administration and the teaching corps. The director is also responsible for the issuance of the *Educational Report* which up to this past year has been an annual publication.

One service which the department has rendered to an increasing degree is that of general counselor to individual principals and teachers who have solicited aid in solving their professional problems of the school or classroom. It is a service like this which really gives the greatest satisfaction to a director of research, because it has a direct influence upon the daily practice of the teacher. Too many statistical reports are either unread or by the very weight of their statistics tend to inhibit immediate application of the suggestions implied in the conclusions of the report.

Another satisfactory experience along the same line is the conference with teachers which often follows the issuance of a statistical study involving retardation, failure, or the evaluation of some pedagogical result. Here again there is that vital relationship between the activities of reasearch and the application of such truth as research helps to disclose.

Houston, Texas, Projects. — Special studies, or research projects, are conducted by the Department of Child Accounting and Curriculum, of which C. F. McElhinney is assistant director. This department is responsible for the production and distribution of curriculum bulletins, course-of-study materials, and other publications; for the consolidation of educational statistics and the preparation of statistical reports; for the direction of the Central Professional

Library and Visual Aids Library; and for the preparation of such analyses, reports, or research projects as may be requested by the superintendent. At the present time, four studies are being made:

1. Coöperative Study of Teacher Education.—The Houston public school system is one of the 34 educational institutions which participated in the Bennington Conference on the Coöperative Study of Teacher Education. Houston was represented at this conference by E. E. Oberholtzer, superintendent, and W. E. Moreland, director of personnel. Organization of committees for this three-year study has recently been effected. It is planned to devote major attention to the problem of the growth of teachers in service. Discussion groups of teachers will attack this problem, developing its major issues and outlining tentative conclusions. The results of these discussion groups will be canvassed by the general committee of supervisors, principals, and teachers, after which the second phase of the study will be instituted. This will be concerned with means of putting into effect the recommendations of the group.

2. Cumulative-Sick Leave.—Data are being assembled for the superintendent and a committee of the board of education on the question of cumulative-sick leave for school employees. At the present time, employees are allowed ten days sick leave per year with full pay and additional ten days at half salary. The advantages and probable cost of adopting a plan whereby unused leave may be accumulated are being analyzed.

3. The Twelve-Year Plan.—Like most Texas cities, Houston has an eleven-year school system organized on the 5-3-3 plan. The board of education has requested the superintendent to report on the advantages and probable cost of changing to a twelve-year basis.

4. Single-Salary Schedule. — Houston is now using a "position-preparation" type of salary schedule. A report on the desirability of adopting a single-salary schedule and on the method which might be adopted in changing from the present plan is being prepared.

In addition to its participation in the above mentioned projects, the department has in manuscript a consolidated statistical report for the years 1930-1939. This will be published shortly. During the past year, a committee of the board of education has been working on a revision of the rules and regulations. Adoption and publication of these are expected later this year.

The Central Professional Library is maintained for the use of all instructional employees. Books, pamphlets, and periodicals are available, covering every phase of the school program. The Visual Aid Library was started in 1936 with the purchase of two projectors and fifty films. It is growing rapidly and acts as a central clearing house for the circulation of visual materials among the schools.

Research Activities in Salt Lake City.—As one of the routine responsibilities of the Department of Curriculum and Research of the Salt Lake City public schools, direction was given to the administration, scoring, and interpretation of a test of reading readiness given to 2,206 beginning pupils in the first grade of the schools of the city in September of the current school year. Of this number it was found that 319 or 14.5 percent of the entire group were definitely lacking in their readiness to begin reading and were in need of specially modified programs of activity to develop such readiness.

In October 9,596 mental tests were scored by the Department and individual interpretations were provided for

the schools. This number included all the pupils in the third grade, sixth grade, the second year of high school, and children enrolled in other grades of the schools for whom no mental test ratings were on record.

Three teachers in each of two high schools in Salt Lake City are participating in the Stanford Social Education Investigation. The Department is cooperating in evaluation of the experimentation that is being attempted in the social studies program of instruction in these six classrooms.

The Department is assisting in a detailed survey of transportation conducted by the State Department of Public Instruction. As expressed by the State Superintendent of Public Instruction, "the data secured will be made available for those interested and will also prove helpful in the equalization program."

The Board of Education of Salt Lake City has a rule that children to be admitted to kindergarten must be five years old on or before October 31st, and that children to be admitted to first grade must be six years old on or before October 31st, of the particular school year during which admission is requested. This rule regarding age specifies that exceptions shall be made "only if a careful case study, including a physical examination and mental test, indicates that the child's educational progress would be seriously handicapped by delaying his entrance into school until after he has reached the specified age." The Superintendent of Schools has asked that a study be made of the school success of children who have been granted this special permission to enter school under age. This study will be undertaken during the current school year.

The supervisor of research is Arthur E. Arnesen.

West Virginia Studies.—The investigations summarized below have been published in the *Monthly Bulletin* of the Department of Education of West Virginia. They are reported by Richard E. Hyde, Director of Research.

A questionnaire study entitled "The High School Product and Guidance" revealed the following findings concerning the rationalization of vocational choices of freshmen in a teachers' college:

1. Residence had affected too much the choice of college, which is a vocational choice in this case.
2. The average student had decided at the age of sixteen to teach.
3. A large majority of the students seem to have a real interest or ability that will help them in teaching.
4. The high school had not guided the vocational choice in most cases.
5. Friends and parents had greatly influenced the occupational choices.
6. Most of the students seem to have done considerable individual thinking as to their future occupational careers.

On the whole the evidence was conflicting, but certainly it is clear that there is much to be done by the secondary school in promoting the rationalization of vocational choices.

An analysis of the results of the state arithmetic tests administered February 3, 1939, was made. The standard ratings on this test were: rating of eight, excellent; six-seven, very good; five, medium; four, danger or marginal ability; three or less, unsatisfactory. In arithmetic processes the state trends showed that the fourth, fifth, sixth, and seventh grades attained a median rating of four or "marginal ability" which is, however, one point below the grade norm; the eighth grade and the state attained standard ratings. The exceptionally good showing of the third grade was a repetition of last year's results. Comparing the

results with last year's ratings, one notes that only the fourth grade fell below its median in 1937-38 (one point), while the sixth, seventh, and eighth grades advanced their ratings one point, the eighth achieving the standard. The fifth grade retained its rating of four, or marginal ability. Most important of all, last year the state was one point below the standard rating, but this year the norm was reached. As usual, there was a wide range of arithmetical achievement in the fundamental processes in each grade and in the state at large.

The ratings achieved by the 154,571 pupils participating in the problem solving test were distinctly interesting. All grades achieved a rating of standard ability, and, of course, the state trend was the same. Evidently, grades four, five, six, and seven are fully capable of arithmetical thinking, although not up to par in their command of the fundamental processes. Good progress is being made in achievement in problem solving. Last year the fourth, sixth, seventh, and eighth grades and the state itself were below standard. This condition has been rectified.

Instructional emphasis should be placed upon the fundamental operations in grades four to seven, inclusive. The state itself just barely reached the median in this particular. The answer is not necessarily more drill. Perhaps a better distribution would help. The necessity of analysis of individual test papers and remedial instruction was pointed out. Typical mistakes to look for and to eradicate were mentioned.

A study of the sources of school revenue in West Virginia was made. The earmarked income emanates from these taxes: capitation, certain fines, forfeitures, interest on state moneys in depositories, state license tax on marriages, sales of tax delinquent lands, and all state licenses except those on motor vehicles, hunting, and fishing. However, earmarked sources are a minor part of school income, usually amounting to only five percent of the total state aid disbursed to county school districts. Ninety-five percent of the state grants emanate from the state treasury through biennial appropriations. The entire income of the consumers' sales and service tax is biennially appropriated for schools. Taxes which go into the general treasury and may be regarded as partially used for state aid are: gross sales or business income, charter licenses, inheritance, individual income, insurance, beer, and income from liquor sales by state stores.

A study was made of the educational level of the 16,000 teachers of the state in terms of collegiate credits and college graduation. County school systems were ranked according to the percentage of teachers whose qualifications were on the baccalaureate or a higher level. In nine counties the median teacher was a college graduate, while in the state itself the median teacher was a college senior for the first time in the history of the state. However, entirely too many counties are still employing poorly prepared teachers. The state-aid weight for teacher certification now allows a county to employ and pay well prepared teachers without increasing the local property tax, formerly the only source of revenue.

Other activities include: Compilation of the state educational directory, service on the state committee on American Education Week, assembling of material for the state superintendent's biennial report, and the construction of a handbook for school finance accounting.

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